

allergy

ITS MYSTERIOUS CAUSES AND MODERN TREATMENT

by The Allergy Foundation of America

THE NEWEST FACTS ABOUT A SERIOUS HEALTH PROBLEM

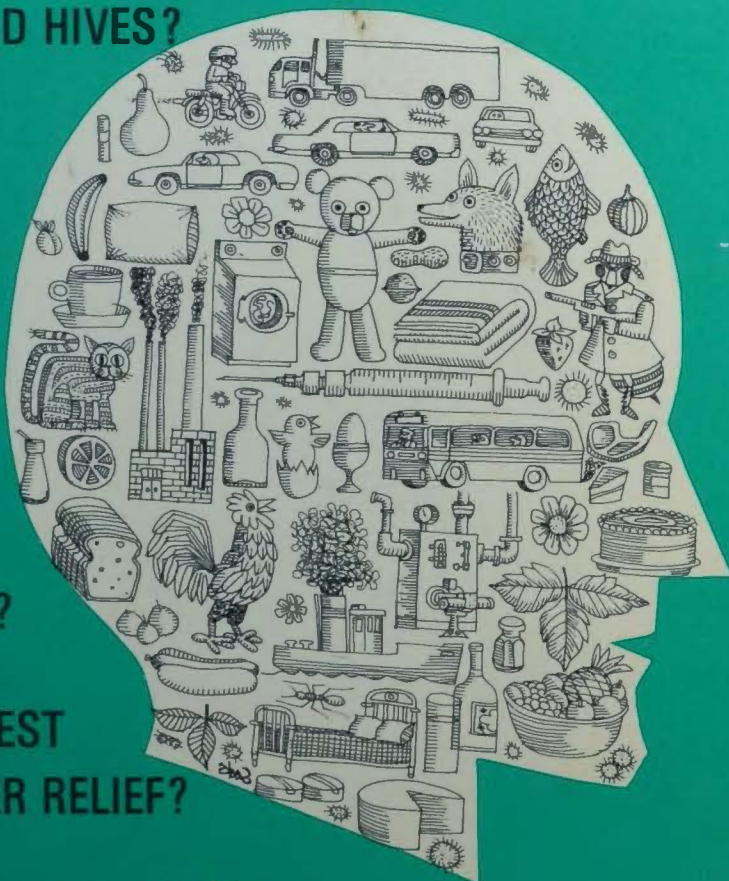
HOW MUCH CAN NEW DRUGS RELIEVE ECZEMA AND HIVES?

WHEN CAN A BEE STING KILL?

CAN ASTHMA BE RELIEVED?

DOES AIR POLLUTION CAUSE BRONCHITIS?

WHAT ARE THE LATEST FACTS ON HAY FEVER RELIEF?



Such pertinent questions are answered in detail in this comprehensive guide to allergies—what they are and how they can be treated.

\$1.00

allergy

Its Mysterious Causes and Modern Treatment by The Allergy Foundation of America

At least one out of every ten persons in the United States is an allergy victim. Allergy ranks **first** in frequency among the chronic diseases of children, and usually retains its virulency among adults. Despite these facts, there is an acute shortage of allergists in the medical profession (one allergist for every 11,000 sufferers). Few doctors know enough about allergies, and the public even less.

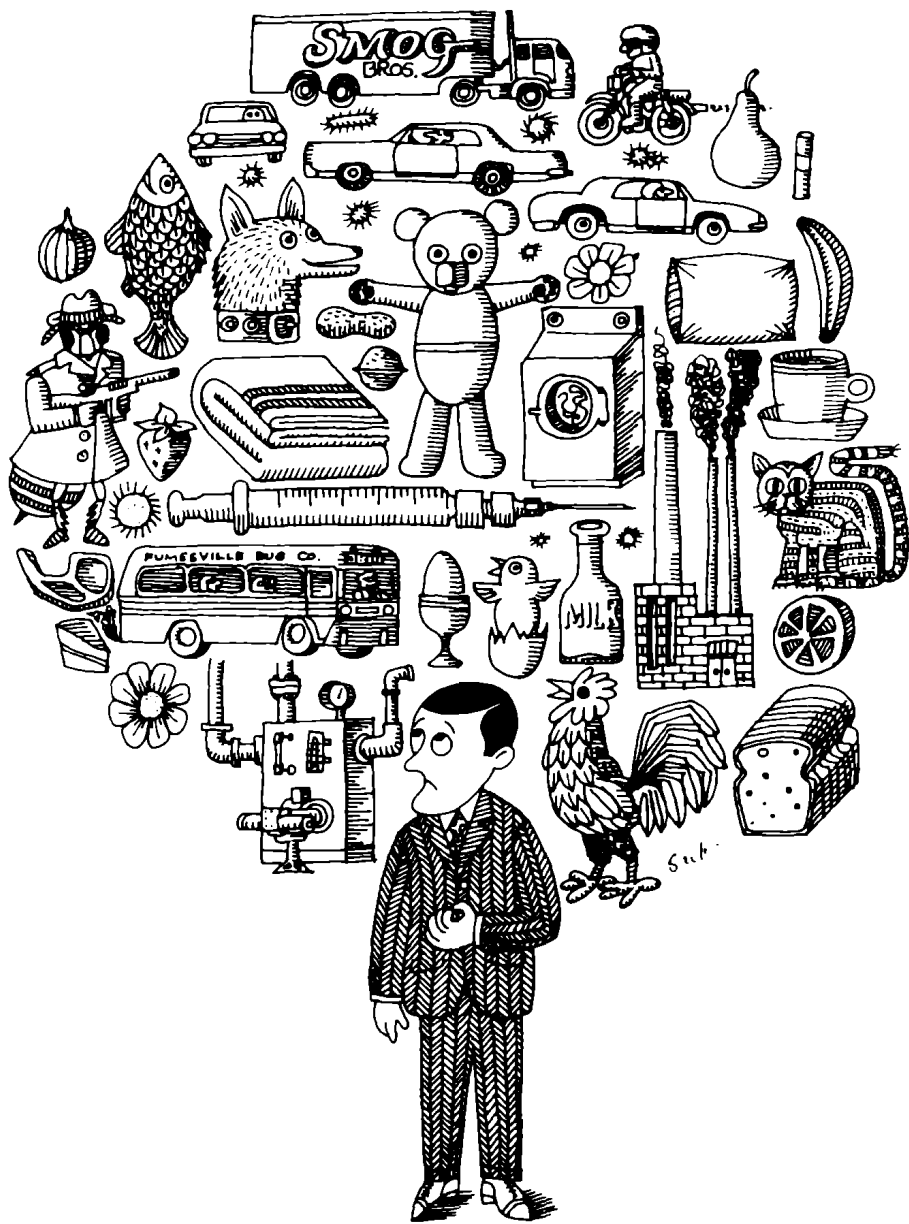
This informative new guide cuts through the maze of confusion and explains all aspects of allergies in terms the average reader can easily understand. Every conceivable type of allergy is examined with discussions of the causes, symptoms, recommended medication, and possible cure applicable to each.

The Allergy Foundation of America is a national voluntary health agency established to unite the public, the medical profession, research scientists, and public health workers in a campaign to solve the problems posed by the allergic diseases.

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**Its Mysterious Causes and
Modern Treatment**



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THE ALLERGY FOUNDATION OF AMERICA

Grosset & Dunlap

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Foreword

This volume was prepared by the Committee for Public Education of the Allergy Foundation of America.

One of the objectives of the Allergy Foundation of America is the support of research and training in the field of allergy. This is accomplished through the Scientific and Educational Council.

Another objective is the conveying of accurate information on allergy to the public. This is accomplished through the Committee for Public Education.

We hope this book answers your questions and gives you an understanding of what is meant by allergy, what allergic disease is, and what you can do about it.

Thanks are gratefully extended to Mr. John Barbour, for his advice and assistance, and the members of the Committee for Public Education.

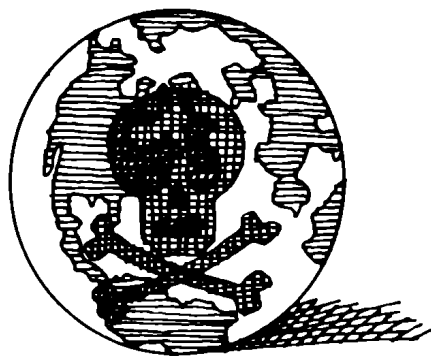
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ALLERGY

Its Mysterious Causes and
Modern Treatment



An Itch, a Sneeze, a Cough, a Wheeze

THE WORLD ABOUNDS in poisons—a thousand and one natural formulas that are fatal to everyone.

But for many human beings the world also abounds in a thousand and one subtle, personal poisons that rarely cause death. They lead instead to a life of periodic, sometimes constant misery, a life aggravated by itches, sneezes, coughs and wheezes, for some a life of crippled pleasures, crippled breathing, crippled vitality.

And indeed, for some, the wear and tear of such a half-life may eventually lead to premature death, to chronic respiratory disease and to a vulnerability to respiratory infection. Not for many, but for some.

Those are some of the effects of the often life-long, often unrealized battle with allergies. For almost all those tormented by allergies, the effect is one of torture, not of death.

How many Americans suffer from allergies is not clear. The best estimate is that 20 million suffer from common allergies; that 13 million suffer from hay fever and/or asthma, that these people collectively spend some 37 million days a year in bed with their ailments, that their activity is limited by their allergies some 92 million days a year.

The problem, however, is probably much worse than this picture based on federal surveys. Medical studies of school children and

adult groups in areas ranging from Chicago to Denver to Montreal offer a hint. Teams of doctors tested these groups for allergic reactions and the studies showed that between 23 and 29 per cent of those tested—an average of one in four—had allergies that could be diagnosed by doctors.

In short, not everyone who has an allergy knows he has an allergy. In fact, there is a possibility that allergies may constitute one of the most widespread, undiagnosed diseases in the United States.

The serious question this poses for anyone with repeated skin or breathing or digestive irritations of unknown cause is clear: "Do I really have an allergy?"

The trouble with allergies is that they have so many causes, and they show themselves in so many ways.

—To the skin they may be an itchy rash, blisters, scaling, hives or swelling.

—To the eyes they may be unexplained itching and weeping.

—To the digestive tract, upsets, diarrhea, weight loss, failure to absorb essential vitamins.

—To the respiratory tract, chronic sinus trouble, sneezing, plugged up ears, irritated throat, hoarseness, stuffed up nose, a fullness in the chest, coughs and troubled breathing, ultimately perhaps the throttled half-breath and wheeze of asthma.

All of these are remarkably common—more common than is comfortable. Asthma—the labored breathing of clogged bronchial tubes—is a case in point. It kills many thousands of Americans each year. For many who are not killed by severe asthmatic attacks, the wheezing disease can lead to a more chronic and desperate situation—emphysema. Slowly that disease results in the hardening of lung tissue and the accumulation of fluids that chokes off the oxygen supply to the blood and leaves its victims progressively more breathless and weary, ultimately disabled. More than 17,000 Americans die of emphysema each year—seven times more than died from the disease ten years ago.

So wide is the range of allergic poisons and their reactions that the victim may be left with a skin rash from a weed like poison ivy or he may be killed by something as insignificant as an insect sting, or he may go into shock, thence to death, from the injection of a needed antibiotic.

It is a common thing to hear someone say, "Oh, he was born with his allergy." But it just isn't generally true. People are seldom born with allergies. Some are born—at worst—with an immediate susceptibility to allergic disease.

There are instances, however, where susceptible offspring encounter

elements they are allergic to before they are born. In these cases, the guilty agent passes through the protective barrier of the placenta and affects the still developing fetus. Had the agent not been present in the mother's bloodstream the child would not have encountered it until after birth.

If you are born with a susceptibility to allergy, when you encounter a substance you will be sensitive to, you begin the process of allergic reaction. That substance—that personal poison that affects you—is called an allergen. But oddly enough it might take several encounters over a period of time before that allergen produces the symptoms of allergy—before you show a real reaction. It might occur at almost any age. It might occur shortly after birth.

The allergen might be as pervasive as house dust, as avoidable as garlic, as unavoidable as sunlight, as modern as plastic, as helpful as aspirin, as friendly as a dog, as common as potatoes, as innocuous as a seed, or as surprising as the sting of a bee.

It is truly a personal and individual disease.

Allergens find four roads to their sensitive target—four roads that are nearly impossible to avoid in the course of living.

- They are inhaled.
- They are eaten, drunk or taken as medicine.
- They are touched or worn.
- They are injected through the skin, by a doctor or the sting of an insect.

Just what is the inside nature of an allergy? Wouldn't it be nice to know the exact details? One thing doctors do know and are pursuing ardently is that the body reacts to invasion by foreign agents and germs by producing antibodies against the invaders.

That in fact is the way vaccines work. Germs—bacteria and viruses—that are dead, or sometimes weak living cousins of disease-producing germs, are introduced into the body. Then the body produces protective antibodies against them, and these antibodies then act as powerful weapons against the disease-producing germs.

That is the way the body fights infection and disease, and the way medical science has developed to prevent infection and disease.

But in allergies the invaders are seldom germs—that is, viruses or bacteria. Still the human body reacts to the invaders in much the same way whether the agent is a grain of pollen or an unfriendly chemical in shellfish, and it doesn't matter what the route of entry—the mouth, the skin or the lungs.

The study of antibodies is important not only in allergy and in infectious disease, but in the fight against cancer and the long look doctors are taking into transplanting organs in the body. For instance,

doctors hope that they may be able to find that the body produces antibodies that can fight cancer, and they are interested in learning how to hold down antibody production when they want to transplant an organ from one person to another. It is largely the formation of antibodies to another person's tissue that prevents the effective, permanent transplantation of one organ to another's body.

The problem in allergic people seems to be that the protective action against the invader gets out of hand. Indeed, the very cells of certain affected body areas seem to disintegrate and leak fluids, and this produces hives or the irritation of an itch or sneeze, or the accumulation of mucus in a cough.

This kind of ultra-sensitive reaction to invasion is the sort of thing that can be inherited from one's parents, even though the invaders that attack a man might be completely different from those that later attack his son. They might be as different as cornbread and sleeping pills.

Doctors can test your sensitivity to different agents quite easily. They simply scratch the skin with small amounts of a suspect material, or they inject a small amount between the layers of the skin. Then they watch for the immediate reaction at the site where the injection was made. It is like giving a small, mosquito-bite-sized sting of a possible venom and waiting for the itch, and the lump. If the lump develops, the doctor knows one of the agents you are allergic to.

The basic idea is hardly new. One recorded instance of immunization or desensitization dates back to the ancient king Mithridates of a land that was to become Persia. One of the most successful of emperors to resist Rome before the time of Christ, he was, however, suspicious of those around him. He feared, as kings have a right to fear, that someone might poison him to usurp his kingdom. To protect himself, the story goes, he began taking small doses of poisons to build tolerance to them. The poet, A. E. Housman tells his story:

He gathered all that springs to birth
From the many-venomed earth;
First a little, thence to more,
He sampled all her killing store . . .
—I tell the tale that I heard told.
Mithridates, he died old.

In much the same way, doctors today desensitize a person to the things he is allergic to. They actually inoculate him bit by bit with the very elements that cause the trouble. It is, in fact, one of the few ways allergies can be attacked. And even this method has to be repeated because it will last for only a limited period of time.

The other positive way of ridding yourself of your allergy is to stay

away from the things to which you are allergic. As effective as it is, avoidance is often the most difficult thing to do.

Easy or not, treatment is a must. There seems to be a chain effect to most allergies. No one can afford to ignore them. The human allergy victim beset by the runny nose and sneezing of hay fever can find that after years of neglect the condition has become chronic, with serious sinus trouble or asthma. Waiting too long for a child to outgrow his asthma too often invites permanent bronchial and lung damage, and, with it, a shortened life. *Children do not outgrow allergic disease.*

Many believe as well that there is a chain reaction leading from allergy to infection. It is easy enough to see how this would occur in a skin allergy where the protective cells are broken and the rash becomes infected by bacteria.

But much the same thing can happen to the breathing areas of the body. The normal defenses of the nose, throat and lung system can easily be disrupted by an allergic attack, even a mild one. The clogging that begins sets up perfect areas in the sinuses and elsewhere for bacteria to grow. The free ventilation essential to keeping the breathing area healthy breaks down. The fact that we are erect animals gives gravity the next important function. Essentially the bacterial infection gravitates from the nose area to the lung area. Furthermore, the moist, warm and undisturbed nest for the germs protects them from antibiotics or the body's defenses. If the allergy is not cleared up the condition remains to breed new infections or to provide a safe haven for the hold-outs from the last one.

This is just another reason why the treatment of the allergic individual is a necessity. The allergic response and whatever passes for the common cold or flu often walk hand-in-hand right through the supposed sanctity of the body.

One internist in New York City insists that his patients who are treated for infections of the lower respiratory tract continue treatment until the entire breathing system has been wiped clean both of infection and other problems. Otherwise, he says, the invitation to re-infection remains open.

By definition, allergy is simply a sensitivity to things which are harmless in themselves—that is, they are harmless to most human beings. But not to an allergic person.

Yet the field of allergy is extremely broad. There is some notion, for instance, that rheumatic fever may be an allergic response to the bacteria that cause strep throat. Some scientists suggest that some forms of epilepsy may have an allergic background. Some blood diseases have been attributed to allergy. Some kidney diseases have been linked to allergy. In some cases, doctors have attributed infertility to an allergic response of a woman to the sperm of her mate.

Some asthma victims, it is reasoned, are allergic to the bacteria in their respiratory tract.

The emotions too play a role in allergy. Excitement, anger, even fear, can trigger allergic attacks—and sometimes a psychiatrist has been called in to relieve the emotional anxiety of an allergy victim and contribute to the patient's improvement. But emotional stress does not cause allergic diseases in anyone who is not allergic to begin with.

The role of the emotions is not clear. But perhaps it is because the emotions call forth certain hormones in the body, adrenalin and other stress hormones, upsetting the natural hormonal balance, worsening and enhancing the allergic response. Besides, in the asthmatic's fight to breathe, the threat to life is very great in the patient's mind. Panic often results. Breathing is an automatic function of the nervous system, and a threat to the breathing system brings a kind of automatic fear with it.

Anyone who has seen the wild retractions of a stricken child's lower chest and abdomen as he struggles to push air out of his lungs can understand what the asthmatic goes through in terms of work and fear. The heart rate increases—sometimes wildly and dangerously—and the anxiety is very real even to the healthy bystander at bedside.

With most infectious diseases submitting to the control of vaccines and drugs, the field of allergy research is receiving new impetus. Allergy research is often linked with infectious disease research, as at the National Institute of Allergic and Infectious Diseases, one of the National Institutes of Health at Bethesda, Maryland.

But the linkage is a natural one. For there is almost certainty that many of the ailments listed by sufferers as colds and flu are in reality allergies masquerading with the same symptoms.

The American Academy of Allergy and the American College of Allergists, mindful of the problem, organized in 1953 the Allergy Foundation of America to stimulate basic research on allergic diseases, boost professional training in medical schools, and increase public knowledge. The problem of hay fever and other allergic diseases is making slow but certain progress toward a solution.

Much of the research is pushing forward in the field of immunology—the study of the body's defenses against disease and invasion. The lessons to be learned are so broad that they will affect not only the diagnosis and treatment of allergy, but the possibility of new ways to attack cancer and new methods to permit the transplantation of organs from one individual to another.

Meanwhile, the misery and the attrition go on. Besides the deaths, there is the debility and torment of allergy sufferers in millions of American homes. Twenty-five million man-days of work in industry are lost each year at a cost of some \$400 million. Millions of school days lost deprive allergic children of their right to a continuous, effec-

tive education. How much more of the human spirit is lost in the lonely and personal battle against the secret allergic enemies one can only guess.



Hay Fever— Allergy Enemy No. 1

HAY FEVER IS *no* laughing matter. Ask the person who has it. Old Hollywood movies would portray the hay fever sufferer as a silly, inept person somehow personally responsible for the fact that he breaks into paroxysms of sneezes everytime a pretty girl waves a flower at him. The portrait is at once insensitive and inaccurate. It isn't the flowers that bring on hay fever.

Hay fever is a multitude of torments, none of them pleasant and all of them potentially serious. Although the figures are not precise, it is estimated that one in twenty Americans has hay fever—perhaps eight or nine million people in all. And one out of every three of these may find their hay fever turning into asthma with time.

Let's take a close-up look at this cruel and common ailment, what it is, what causes it and what can be done about it.

It is purely and simply an allergy. It leads to wild spells of sneezing; the nose runs; the eyes become itchy, tearful and swollen; the roof of the mouth is sore and itchy, as is the throat and the nose. There may be, as well, stomach upset, lack of sleep, irritability and headache. As if that were not enough, it is sometimes accompanied by hives.

It is caused by pollens and molds, and there are many kinds of these offending creatures of nature. Pollen is the male germ of plants,

trees and grasses. Each grain of pollen is tiny, one half of the union that will eventually produce a new seed and thence a new plant. The pretty, flowering plants that attract insects by their color generally have a heavy pollen that sticks to the bodies of insects and is carried in that manner from flower to flower to an eventual union with the female germ cell or egg.

But some plants aren't attractive at all, and rely on the wind to carry the pollen to others of their kind. These plants have extremely tiny pollen, powdery as dust. The pollen of a ragweed for example is barely 1/2500th of an inch in diameter. It is the release of great quantities of this type of pollen into the air that leads to hay fever. A person who is susceptible to hay fever breathes in the poison that causes his misery.

Pollen is produced by different plants in different seasons. In the spring, the pollen that causes hay fever is produced by trees like the elm, birch, maple, ash, oak, poplar, walnut, sycamore and cypress. In mid-summer the hay fever dosage of pollen comes from grasses. And in the fall comes the master of hay fever pollens, ragweed, and its cousins. In its season in the central states and the east alone ragweed produces a quarter million tons of pollen—enough to build a mountain.

It takes a while for a case of hay fever to build up, even in susceptible people. Usually unawares, the person with allergic tendency breathes in the pollen and it slowly attacks the cells of the nose, eyes and bronchial tubes over a period of months and years.

These cells react by producing antibodies to the pollen. The antibodies—normally protective protein soldiers that can take a foreign protein into custody—link up with the antigen from the pollen. The antigen is protein also. But in the allergic person the link-up of the two brings on some harmful side effects. A number of substances are formed in the process, among them a substance called histamine. It is this histamine that causes the swelling in hives and the irritation that produces hay fever. When enough of the sensitizing antibodies are produced, even a small meeting with pollen after that can bring on an attack of hay fever. While the histamine is the prime suspect in the hay fever or allergic attack, there are some other body chemicals that bear investigation also.

The danger that follows is that the hay fever sufferer will merely suffer with his ailments. This in many cases leads to the complications of asthma, and thence to even more serious lung damage. Hay fever should not be neglected—but there just aren't enough allergy specialists in the nation to treat everyone, and the burden often falls on the general practitioner who often needs more information on the diagnosis and treatment of this ailment.

Hay fever or other allergies that affect the upper respiratory tract are hardly invisible diseases. The child with a respiratory allergy like

hay fever may carry the signs of his problem as plainly as the eyes on his face. Allergists have noted that the child who seems to have constant cold-type symptoms develops dark circles under his eyes. These "allergic shiners" are a sign of chronic nasal allergy, and are caused by the swelling of the mucous membrane in the nose and sinuses. That in turn impedes the flow of blood in the "below the eyes" area and the blood tends to pool there, giving a dark shading. Spasm in the muscles of the area can also contribute to bags under the eyes. Another sign of a child with a persistent nose-clogging allergy is the open mouth for breathing.

The hay fever victim can be helped. He can carry on a normal existence and he can be comfortable. But he must not try to treat himself. He needs expert medical attention.

One of the drugs that has proved useful in helping allergy and hay fever sufferers is antihistamine. It does just what its name implies. It fights the histamine that has been tagged with the irritation-causing role in allergy.

But as useful as antihistamines are, they are not the main method of treatment. The best and most effective treatment in allergy is getting away from the things you are allergic to. Sadly, most places in the country have pollen-laden air during part of the year, but there are some exceptions—places of high altitudes, high northern climates, and areas near large bodies of water. Still a person should not just go off willy-nilly because he thinks he has hay fever and is trying to avoid his allergy. He needs medical advice on where he should go, and just what he is allergic to, lest in running from one allergen he might run into another.

Sometimes air-conditioning can help—if the hay fever victim can remain in the air-conditioned area and temperature is kept at a reasonable level. The temperature should not be lowered drastically because the cold can irritate the nose and bronchial tubes. Doctors say that moderate cooling, temperatures not more than 12 degrees lower than outdoors, are the best the hay fever victim should seek. Some of the new, large electrostatic systems for taking the dust and other foreign elements out of the air are effective too. But some of the smaller units sold at retail stores have been labelled ineffective by the Food and Drug Administration—so far as respiratory and allergic conditions go.

The most practical effective method of beating the hay fever plague requires cooperation from the patient and expert medical attention. It means a series of injections to desensitize the victim to his allergens, usually the hay fever pollens. It works this way:

A doctor prepares or obtains from pharmaceutical firms extracts of a particular pollen or mold. Then he begins a series of injections, starting with small doses and gradually increasing them. The body

reacts to the injections in the usual way. It works up a reaction against the pollen extracts by forming antibodies. But these are *effective* antibodies. They are not the sensitizing antibodies that trigger a hay fever attack. The new antibodies actually protect against that malicious partnership in which the sensitizing antibodies combine with the pollen to produce the hay fever reaction. Slowly the body, reacting to the immunizing shots, builds up a supply of the new antibodies, and these stand by, awaiting the pollen attack. The trick is doing the antibody desensitization slowly. Some patients may benefit after three or four injections, but more often the desensitizing procedures take weeks or months. They may have to be repeated for years.

Sometimes the hay fever shots will apparently fail to help an individual. When that happens some patients become discouraged and discontinue treatment. The truth of the matter is probably that, since they have a susceptibility to allergy anyway, what has happened is that they have become allergic to a new substance. In that case quitting won't help. The doctor will have to begin the skin tests again to pinpoint the new enemy, and plan a new program to protect against it.

One recently tried method—still considered largely experimental—has been developed to short cut the long and involved series of immunizing shots. In this method the doctor may prepare extracts of one or more of the elements you are sensitive to, and suspend them in a sort of oil emulsion. He then injects this material, and the site is marked by a large lump, a sort of reservoir of allergen which is to be gradually absorbed into your system. The idea is to free both you and the doctor from the problem of repeated visits for injections.

But this one-shot, repository treatment has problems too, problems that the Food and Drug Administration says are not yet solved. Is the absorption of the actual antigen at a proper rate? How do you measure dose? Does the oil cause effects in the allergic patient? And finally, how can you remove the material from the patient should that be necessary for some reason? At any rate, this is one experimental approach, and one which will require further work.

Even the process of desensitization—though widely used and proclaimed largely successful by most doctors—has come in for criticism by some. And yet desensitization is considered the treatment of choice. There is, as yet, no effective substitute. There is the need for more research and a better understanding of the allergic process. Long hidden under the cloak of the infectious diseases, allergic disease has now been uncovered because of the success of antibiotics and vaccines against infection. The difficult job of pursuing allergies in their multiplicity of disguises should now begin to reach a higher pitch—purged, so to speak, of the underlying possibility that allergic and infectious disease might be confused.

Whenever the pollen season begins, the hay fever sufferer should

have already been under a doctor's advice and treatment. Usually desensitizing injections will be given before the season begins, sometimes during the season, sometimes all year long. The only one who can make these decisions is a doctor, and he should have time well before the hay fever season to decide which is the best course.

There is one thing ragweed and other pollen sufferers should bear in mind: they may be far more uncomfortable than the daily pollen counts would seem to imply. The reason is that the level of pollen does not mean more or less discomfort with its fluctuations.

In fact, say some doctors, the hay fever sufferer should be told emphatically not to expect the daily pollen reports in newspapers or on radio and television news shows to reflect his own sneezing like a stock market report. One reason for this is that in some cases there is a strong psychological tie; the person who reads a high pollen reading and expects to feel worse, will feel worse.

To further point up the psychological effects of this, some patients begin their symptoms before the pollen season begins and some have symptoms long after the pollen season ends. In short, the first frost that kills the ragweed doesn't always kill the patient's hay fever. One reason for this is that a patient who has neglected his hay fever may find that the inflamed nose and throat have developed more or less chronic inflammation by the time the season ends, or he may have further sensitivities.

In allergy, as perhaps in few other diseases, it is impossible to separate the patient from his ailment. Indeed, some patients can actually pass on their allergy to others—but only under unique circumstances. That is the reason why some doctors advise against the use of allergic persons as blood donors. One such donor, who was allergic to horses, gave blood to an otherwise healthy person. The healthy individual came in contact with horses some two weeks later and was stricken with an allergic attack of asthma because of the sensitizing antibody in the transfused blood.

In other work, doctors found they could transfer ragweed sensitivity to normal persons with lymphocytes, the white cells that play a role in the fighting of disease. The non-allergic persons receiving the material from allergic persons showed skin reactions when challenged with ragweed pollen.

Meanwhile the research goes on. The director of the National Institute of Allergy and Infectious Diseases said recently that the institute was continuing its program into standardizing allergens. The most refined product they have isolated so far is King's Antigen E, which contains about 6 per cent of the protein in ordinary ragweed extract, but perhaps 90 per cent of the antigenic content. This means that a smaller amount of the actual protein poison might produce nearly all the effect. In short, a more refined extract could be used in

smaller amounts with greater effect than less refined extracts. Yet in 1966 the new material still awaited trials on carefully selected groups of humans.

The future for the hay fever victim then has two major directions, one short term and affecting the individual case, the other long term and affecting new answers and better treatments.

This much seems certain:

An individual who suspects he has seasonal respiratory distress should see a doctor—preferably an allergy specialist—to have allergy tests.

If an allergy program is begun for him, he should be prepared for a long battle, and expect that effectiveness of the treatment will improve as he continues it.

He should not fool himself into thinking his allergy will go away by itself. Nor should he underestimate the good chance that untreated it will become chronic and untreatable.

Some good tips for the hay fever sufferer, especially those who have not been desensitized, are:

Avoid areas where you know you will encounter dusts. If this is not possible, wear a good nose mask.

Avoid getting chemically treated water from a swimming pool in your eyes and nose.

Avoid insecticides, and the fumes of paint, smoke and chemicals.

Avoid overwork, over-tiredness, overeating.

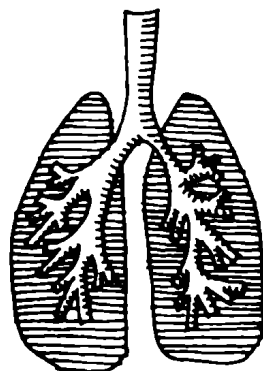
Avoid contact with cosmetics such as perfumes, hair sprays and wave lotions.

Avoid weed patches and uncut fields.

Avoid tobacco smoke—yours or someone else's.

Hold down on the amount of alcoholic beverages you drink. They stimulate mucous secretions in the nasal passages.

Avoid changes in temperature by staying out of strong drafts, and keep your body warm. Don't catch cold. Try to sleep in a moderately air-conditioned room.



The Road to Asthma

AT FIRST, THERE was the familiar tightness in his chest. His cough was persistent, but it produced little, even in terms of easier breathing. He had to try harder to breathe, but still he felt short of breath.

Later, as his chest heaved with each breath, his neck muscles became strained and taut with the effort. The wheeze now sounding in his chest was getting worse and seemed to protest his effort. For hours he struggled for every breath, his stomach tightening convulsively to push the used air out of his lungs. He was horribly tired, but lying down seemed to make breathing more difficult. He sat up and leaned forward instead. It seemed to help. And about it all, he felt a growing anxiety, a deep-felt hope that this tightness would stop, and a fear that it wouldn't.

In his misery, he was hardly alone, but he never felt more alone in his life.

Such is the torment of some three million Americans who suffer from asthma. It is not often a fatal disease. Yet thousands of American deaths are attributed at least in part to asthma. It is sometimes a chronic disease, yet some sufferers have only occasional attacks. Often it is avoidable, yet some let it happen to them in a slow progression from milder ailments. It can often be controlled, yet some in ignorance

or in sheer neglect let it progress to even more serious chronic disease.

Asthma is, by and large, an allergic disease, stemming from allergic causes. True, some asthmas are products of infection, some are linked to the circulation difficulties of oldsters with heart trouble. But mostly it seems to be an allergic agent that sets up the body for the asthmatic attack. And as in any allergy, the agent—the allergen, the personal poison—can be highly specific, highly individual. The list of candidates is long: pollens, molds, chemicals ranging from insecticides to hair lotions, dyes, feathers, cosmetics, perfumes, eggs, wheat, fish, chocolate, milk, the decayed body of a bee or wasp, a sudden change in temperature, aspirin, penicillin, even sunlight. And these are just a few of the suspects.

Many experts think that asthma may often be a progression from hay fever when the lesser ailment is left neglected or untreated too long. But whatever causes asthma, if it too is not checked it leads to a much more dangerous and chronic condition, emphysema.

First, let's look at the respiratory system. You breathe in through the nose (when you can) and you begin automatically to prepare the breath of air for use. The upper respiratory system acts as a sort of air-conditioning system, adjusting the temperature and the moisture in the air to normal body values, and the hair-like cilia in the nasal passages act to filter out dust and other foreign elements. The sinuses—air pockets above and below the eyes—act to regulate air pressure. The conditioned air passes on through the pharynx where the tonsils (if you still have them) help filter out infecting agents.

After passing through the larynx, or voice box, the incoming air enters the trachea, or windpipe. The trachea then branches into two main stems, one serving each lung. These branches, or bronchi, themselves branch off countless times, each time yielding smaller and smaller air tubes, until finally each tube serves a tiny air sac. Thus, like some great upside-down and tangled tree, the bronchial system feeds air to the lungs. It is in the countless air sacs, or alveoli, that the oxygen from incoming air enters the blood and the carbon dioxide of used air is exchanged for exhaling.

In asthma, the bronchial tubes become inflamed and fill with mucous. At the same time the lining of the tubes may swell and the smooth muscle controlling the bronchi may go into spasm, reducing air passage. The result: reduced air intake with each breath, more difficulty in exhaling, more rapid and labored breathing, wheezing as the air is forced through the constricted air passageways, coughing as the respiratory system tries in vain to clear itself.

When this condition becomes chronic, and uncontrolled, it can lead to emphysema, a much more dangerous lung disease. In emphysema, the wear and tear of poor bronchial health destroys some of

the smaller air tubes, or bronchioles, and the walls of the air sacs lose their elasticity.

When this happens, the area available in the lungs for the exchange of oxygen for carbon dioxide is greatly reduced, and the patient is slowly starved for oxygen. The U. S. Public Health Service estimates that anywhere from one to ten million Americans suffer from emphysema in some degree, that it is almost as prevalent as arthritis, certainly more common than tuberculosis and lung cancer combined. It usually occurs after the age of 40, but may occur in children. It is 13 times more prevalent in cigarette smokers than in non-smokers.

For too many, asthma and emphysema are the end of a road that began with an apparently harmless though inconvenient allergy, perhaps hay fever. About 40 per cent of those patients with nasal allergies later develop asthma. Indeed, pollen is the most common of the allergens that trigger asthma. It can be the pollen of ragweed or sage brush or grasses or trees such as the oak, maple, ash or birch.

Again, as in other allergies, the body reacts by producing a sensitized antibody that links up with protein from the invading pollen. The partnership of these proteins causes the irritation that begins at the level of the cell, but which can continue until it invalids the entire body.

Perhaps second only to pollen as a cause of asthma are the spores or seeds of molds that grow wildly on vegetable matter. The wind-borne spores contaminate the air from spring through autumn. Other potential allergens—from dog hair to orange juice—are around all year long.

After years of the wear and tear of asthma, other irritants can trigger an attack in the long-aggravated bronchial system—even a pungent smell or the common cold.

Asthma can happen at any season of the year, depending on the allergic cause, and it can also happen at any season in life. But most commonly it strikes before the age of 20, and it almost always has its history in childhood. Time after time, doctors discover that the asthmatic has a family history of allergy—a grandparent or a parent or an uncle or aunt with some allergic disease. Then in childhood there is frequently a bout with eczema, and then hay fever.

Asthma can strike for the first time at the age of two months, or it may not strike until the age of 80. But the odds are less, much less, that you will develop asthma after the age of 40. The likely reason is that by that time, if you haven't encountered the allergen that is going to cause you personal trouble, you probably will never encounter it. Still there is always the chance. One doctor reports, for instance, that many travelers from Europe who were allergy free most of their lives suddenly developed hay fever when they visited the United States for the first time. Why? Because ragweed pollens so common in

the United States, especially in the east, are much less common in Europe.

Sometimes there are great epidemics of asthma, because of the sudden polluting of the air with some irritating agent. Sometimes the culprit is from the smokestacks of industry. There have been reports of epidemics in some villages in France where as many as 60 per cent of the inhabitants were stricken with asthma. The cause was said to be protein from castor oil seeds being processed by local industry. In northeastern France were found areas where air pollution and bad climate combined to produce asthma symptoms in up to 30 per cent of the children.

There have been some serious asthma outbreaks in the United States as well—when an unfortunate wind draws the atmospheric debris from burning trash over a city, or when the smoke of steel plants collects in the air over a valley town.

Quite different results came from a study of asthma cases in three big New York City hospitals—Bellevue, Harlem and Metropolitan Hospitals. Doctors first charted the patterns of asthma cases for three years, and tried in vain to find reasons for sudden increases in cases by comparing them with monitored air pollution levels and levels of pollens or molds in the air.

Then they noticed a curious coincidence. The cases rose markedly in the month of September each year, and the sudden surge was timed precisely with the onset of cold weather requiring home heating. Furthermore, the longer that heating was required each day, the more people there were admitted to the hospitals with asthma. There is the chance, then, that asthma in many cases might be triggered by exposure to cold, the smoke from heating plants, or perhaps by exposure to the suddenly less humid atmosphere of a heated apartment or to some as yet unknown agent in the air.

Basically, the treatment for asthma is like the treatment for other allergies. If an allergen is suspect, the patient should be tested for it. When the skin tests pinpoint the causative agent, the next step is to remove it from the patient—or the patient from it, when practical. Unfortunately, sometimes it just isn't practical, usually because the agent is so universally distributed that there is *no* refuge from it. But the medical part of the decision—and the diagnosis—should be left to the doctor, not to the patient.

If it isn't possible to escape from your personal allergen, or if there are too many to escape, the next course will probably be desensitization injections much like those against hay fever. They help many patients, and are the next most effective way of controlling the situation.

There is symptomatic relief for the asthmatic patient too, but this should be left to the doctor's discretion, not the patient's. Too many

patients can literally kill themselves with self-medication.

A doctor will probably prescribe a fluid-heavy regime. Some critically ill asthma sufferers may require intravenous fluids and glucose to counter the dehydration and energy-sapping effort of a long bout with asthma. Most doctors try to encourage coughing and the patient's own efforts to clear the bronchial tree. For this reason, they may be reluctant to prescribe any drug that would dry up mucous membranes or depress the patient's vital functions.

Sedatives and other depressant drugs, long prescribed to give the patient rest from his strenuous breathing efforts, are now taboo. They may rest the patient, but they also further depress his already strained breathing mechanism.

Injections of adrenalin—or sometimes oral doses when practical—help to calm down the spasms of the bronchial tubes. Expectorants help to clear mucus by thinning it. Ipecac, which most households used to keep handy as first aid against poisoning, is also useful. Ipecac induces vomiting, but it also helps loosen the thick mucus in the bronchial tubes by enhancing more watery secretions. The patient may be able to expel the plugs of mucus during the violence of induced vomiting. But any of these treatments should be used only on the advice of a doctor—and only after he has made a careful diagnosis. It would be stupid and dangerous to treat asthma as an allergy, for instance, if it was in fact caused by an infection alone.

In severe cases which don't respond to other treatment, the doctor may resort to some of the corticosteroid hormones such as cortisone. There are problems involved in the long-term use of these drugs—untoward side effects such as lowering the body's ability to fight off infections and other serious risks. The drugs are effective in fighting off the symptoms of asthma, but they don't cure the ailment. And in most cases the asthma almost surely returns when the drug is discontinued. The patient should understand the risks, and only resort to this treatment when his doctor so advises.

Some things that can be done to make the asthmatic more comfortable without a doctor's advice:

- Keep the patient's room as dust free as you can.
- Provide moderate air-conditioning during summer months.
- Encourage the drinking of warm liquids, much as you would for someone suffering from a cold or fever.
- Make certain the room is as free from allergens as possible, even covering the mattress and pillows with plastic when necessary.
- Keep the patient calm, and follow the dosage of prescribed medicines carefully. Asthma can usually be controlled by oral dosage, although sometimes injections of adrenalin or aminophyllin by the doctor can bring more sure relief.
- Just because a drug seems to help, don't take it at will. Again,

consult the doctor to see if additional doses are advisable. He will prescribe the optimum dosage in the first place.

One study of the deaths of 24 asthmatic children between 1937 and 1963 in Los Angeles focused on the importance of the careful use of drugs in the treatment of asthma. In many of the deaths, more conservative handling of some of the potent drugs before the children entered the hospital might have saved lives. Neither the asthma victim himself nor his parent if he is a child can truly measure the effect of the drugs in asthma treatment. Just because a little gives some relief doesn't mean that more will give more relief. Often the effect can be just the opposite, and life-endangering as well.

If an infection is the cause of asthma, the physician may prescribe antibiotics when their use is indicated. Sometimes, in children, the tonsils or adenoids may be removed as the seat of the infection. Some individuals with heavy sinus infections that are feeding a bronchial infection may have to undergo sinus treatment before the asthma will clear up.

If the asthma is caused by an allergy to food, you'll have to pinpoint which foods are guilty and eliminate them from your diet. This sometimes causes problems in good nutrition, and the diets of asthmatics suffering from food allergies need special attention. Sugar is a good energy food, and it is non-allergenic. Greasy foods, and foods difficult to digest should be eliminated from the asthmatic's diet. Allergic babies most frequently develop food sensitivities—sometimes even to milk. There are good non-allergenic milk substitutes available on the market. Well-cooked foods are usually less likely to be allergenic than raw foods. But again, the doctor should be consulted on the proper diet, and an asthma sufferer or his family should not try to diagnose which food might be the allergen, or which diet would be allergen-free.

For the person who knows he is susceptible to asthma attacks, good physical condition is essential. He should avoid extremes of heat and cold, dampness and dryness. The best relative humidity for the respiratory system is about 45 to 50 per cent. That moisture level in the air promotes the best cleansing of the respiratory tract, and favors neither the growth of viruses nor bacteria.

Few asthma sufferers have to be told to avoid noxious odors and chemicals. But they should also take care to have infections in their mouths, sinuses and throats cleared up.

Most important, the asthmatic needn't be an invalid. Those who suffer mild or infrequent asthma attacks can usually lead an active life in sports and exercise, providing they get plenty of rest and good nutrition. The doctor will know best. Persons with chronic or severe asthma will, of course, have to be moderate in their approach to exercise.

There are some expensive air purifiers that can filter out house dust and other household air contaminants, but these are large and costly units which are generally built into the heating and air circulating systems of the home. The U. S. Food and Drug Administration has warned against small units sold in some retail stores. It called the "promotion of so-called air purifiers for preventing or *treating* respiratory infections and other types of diseases" one of "today's most prevalent health swindles."

Small units, the FDA said, "do not have sufficient capacity for removing dust and pollen which may aggravate allergic conditions such as hay fever, and no air purifier can truthfully be promoted for treating viral or bacterial diseases such as colds, influenza, etc."

Sometimes a change of climate might be advisable. But generally this is a last resort. First should come a thorough allergy testing regime, and full allergy treatment. The doctor may want to know, for instance, if there is some particular element in the patient's home that is triggering the asthma. Perhaps the patient can move into the home of a friend or relative in the same town or city for a period of time to see if he can elude his allergy that way. If his asthma disappears or improves, it would show pretty definitely that climate was not the problem in the first place.

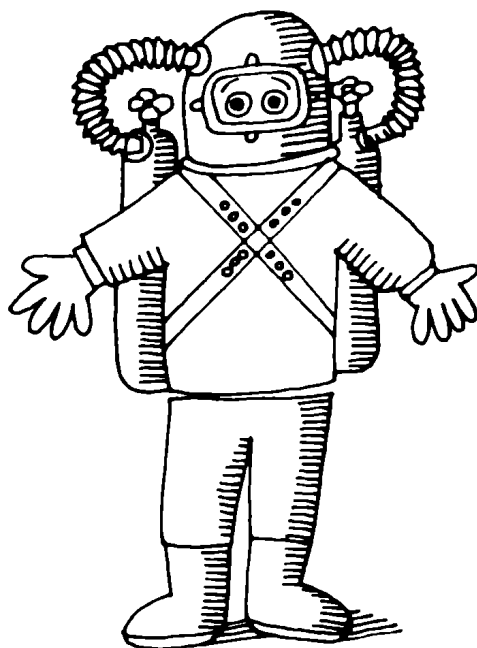
Skin testing and the history of the asthma might indicate, on the other hand, that the disease is triggered by house dust or animal hair, or some other common allergen that could be present anywhere. In that case the doctor will probably order that the home be cleaned up of these allergens as much as possible. It sometimes means giving away a family pet that was innocently poisoning one of the members of the family.

It might be possible to escape some kinds of pollen by moving to another climate. But if the aggravating agent is ragweed pollen, it would be almost impossible to escape, so widespread is its growing pattern in the United States. Besides, doctors warn, a person sensitive to one pollen might develop an allergy to another one, even if he succeeded in escaping his first allergy. Although ragweed is not plentiful in Southern California, allergists there report that the season for other pollens is ten months long, and even in areas where eastern ragweed might be in short supply, sensitive persons quickly become allergic to local plants.

There are economic and social aspects involved in where a person lives, and only the foolhardy would uproot himself on a whim or because, in his judgment, he could escape an allergy by moving. That, after all, is a medical judgment, and the decision should be left to an allergy expert.

Asthma is rarely the cause for drastic action anyway. Good medical care can assure most asthma sufferers of a comfortable and productive

life, with the asthma either defeated or controlled. The best chance of all goes to the young victim who has only occasional attacks and who is allergic to only one agent. The outlook is not as good for the patient who develops asthma in middle life and who develops emphysema or bronchial or sinus infections. Neither is the outlook as good if the asthma has been neglected for a long period of time. But the prognosis is not bad in any case. With the skill of expert medical talent and with modern drugs, asthma can be controlled. Someday, with the help of more research, it will be cured.



The Skin

You Love to Scratch

BETWEEN THE INNER you and the outside world is a thin, highly personal wall. It weighs some six pounds and it covers about 3,000 square inches—all of you.

It is, of course, your skin.

In the course of your life, it takes a fantastic beating, repairs itself, repels invading bacteria, tells your brain the nature of things you touch, senses pain and pleasure, and keeps you cool enough to live, even when it's so hot you don't care if you do or not.

It is also one of the most irritating organs of the body when you happen to run into something to which it is allergic. And that happens more often than anyone cares to think.

The skin is composed of three layers—the outer epidermis, the middle dermis and the underlying subcutaneous fatty tissue. At any one moment, one-third of the blood is in the capillaries and blood vessels of the skin, bringing nourishment and carrying away waste products. The skin adapts itself to the area it serves; for example, it is 1/50th of an inch thick, and rubbery, over the eyelids, and 1/3 of an inch thick, and tough, on the soles of your feet.

It literally keeps you together, holds in your blood and other fluids, manufactures vitamin D when exposed to sunlight, tans, burns and heals itself.

Because it stands between you and the world of poisons, the skin is often the first part of you to face the consequences of poisoning.

The three leaves of poison ivy are one of its most common allergic enemies. Oddly, some people don't think of poison ivy as an allergic condition, but it is. Not everyone, for instance, is allergic to it, and some people can work with it, play with it or sleep in it without any reaction.

It is, however, one of the most widespread allergies. Some 50 to 75 per cent of the population is allergic to it in varying degrees.

Even if you are fated to be sensitive to poison ivy, you won't have a reaction at the first meeting with it. As with other allergies, you build up a sensitivity to the durable resin of the plant by repeated exposure. Doctors showed this graphically by placing a drop of poison ivy juice on the skin of newborn infants, and none of them showed the least trace of a reaction. Six weeks later they did the test again on the same babies and this time 75 per cent of them reacted to the poison.

Poison ivy is a bane to the North American continent. It is virtually absent in the rest of the world. But in the United States, it and its relatives, poison oak and poison sumac, are the most common outdoor sources of allergy.

The sensitive person can't get a rash by just being around it. He must touch it, or touch something that has touched it. For instance, he might avoid contact with the plant during a hike in the woods because he was protected by his trousers. But he may be poisoned by the resin when he later touches his pant leg. Probably even more dangerous is the smoke from burning poison ivy. By contact it can irritate the eyes, the skin and the lungs, sometimes fatally.

Even if you manage to avoid the poison ivy family, there are plenty of other plants that you might be sensitive to that can cause contact dermatitis. The pollen and leaves of the ragweed family, the tumbleweed, daisies, tulips and their bulbs, pines, celery, potatoes and oranges are only some of the common plants to the touch of which people become sensitive. In Europe, the most common allergy plant is the wild primrose. In almost all cases, the resin of these suspect plants dissolves in the natural oil of the skin.

Sensitive people vary in their reactions to poison ivy and the other allergy plants. If they have had little contact, the reaction might be a slight rash. But severe reactions involve widespread inflammation and blisters.

The best way to defeat these noxious plants is to avoid them. Gloves and other items of protective clothing can be a shield between the allergic person and his plant enemy. But care should be taken when the clothes themselves are shed, lest the plant resins win in the end. If you are sensitive to poison ivy and you do happen to touch it, wash with soap and water quickly. It might lessen the amount of poisonous resin your skin absorbs.

Plants are only a few of the allergens in our modern world that can cause contact dermatitis in persons allergic to them. Because allergy is such an individual thing, there is literally no end to the things people can be allergic to. Doctors have found people allergic to the nickel in the frames of their glasses, to the mercury from a broken thermometer or from a home chemistry set, to mercurochrome, which also contains mercury, to perfumes and hair tonics, to lipsticks and nail polishes, to garter clasps and coins of the realm, to silverware and detergents, to the dyes in dresses and the resins in adhesive tape, to the colored ink in the Sunday "funnies," to drugs and anesthetics, to rubber gloves, plastic dishes and shoe polish. Some new drugs designed to strengthen fingernails have been proved to cause contact dermatitis in a few sensitive persons.

Some people are sensitive to the chemicals, metals, plastics, dyes and other things they work with. One source estimates 600,000 people in American industry grin and bear it—because they are sensitive to the products and byproducts of their work.

Almost any agent introduced into our brave new world seems to have potential danger for allergic people. Doctors were warned in the *Journal of the American Medical Association* that some individuals were developing contact dermatitis from some chemicals in anti-bacterial soap. Some persons developed a sensitivity to light after using these soaps. Some cases were so serious that they required hospitalization and the use of strong drugs like cortisone to control the inflammation.

There are other irritating allergic dangers for the skin besides contact dermatitis.

Some young boys with a strong liking for strawberry shortcake have encountered what the doctors call urticaria. No matter how you scratch it, it's still hives. The skin swells into widespread raised white welts usually surrounded by large reddened areas. They may be as small as a mosquito bite or as large as a 50-cent piece, or even bigger. They itch desperately and those that suffer from them scratch just as desperately. When they are untended and severe they can keep a person from sleeping, bring on loss of appetite and generally make life miserable.

Hives are hardly predictable. They may disappear in a few minutes or they may stay on for days. They can be caused by the ingestion of certain foods or drugs. The most common allergens on the menu are chocolate, shellfish, nuts, fish and fruits such as strawberries and tomatoes, to name a few. There is also a sort of cross-reaction among some fruits. The person allergic to cantaloupe, for instance, might also be allergic to cucumbers and watermelon. An allergy to apricots might also mean an allergy to peaches, plums and nectarines. Hives can also be caused by drugs ranging from quinine to penicillin, from some laxatives to aspirin.

There is a sort of hive-like allergy called angio edema. Its symptoms are sometimes called giant hives. They don't itch, but they can attack interior tissues as well as the skin, and they've been found in the mouth, the throat, the stomach and the mucous membrane of the eye. In the stomach they can cause pain and vomiting, and in the mouth they can cause enormous swelling of the tongue and lips.

Giant hives are based much deeper in the skin than common hives. They can also be caused by contact to an allergen like hair dyes or mascara. Because both of these ailments are transient in most cases, the cause is sometimes difficult to determine.

The allergic rash of eczema appears usually in infancy. Babies develop the roughened, itchy, reddened signs of it usually on the face, neck, folds of the elbow or behind the knees. It makes the babies very unhappy and interferes with their sleep and, necessarily, the sleep of their parents. The affected area appears to be a patch of small hard blisters which break and ooze and crust over again. The condition may remain localized, or it may spread to the entire body. Usually it disappears by the age of one or two. But sometimes it persists for a lifetime, or reappears later in life. After a while the affected skin gets thickened and is harder to treat. The child may develop some serious emotional problems because of his exposure to the irritating, deforming ravages of the disease. It should also be a signal to parents to keep an eye on their child later in life too, because childhood eczema usually means a susceptibility to other, later allergies, especially hay fever and asthma.

Like other allergies, it also means your family probably has a history of allergy—a parent, grandparent or other close relative who had similar experience. Food is a common allergen when the eczema is due to an allergy. Most commonly, it would be milk or egg or wheat. Even the breast-feeding infant may face allergic problems from the traces of chemicals from food or drugs in the mother's milk. Some children are so allergic to eggs that they may have an asthmatic attack or a sudden eczema rash by touching the egg shell or being around when an egg is fried.

You can also produce eczema in sensitive people by materials like pollen that are inhaled. That is why some eczema appears in hay fever victims and asthma sufferers; both situations are caused by the same aggravating pollen, house dust, mold spores or dog hairs.

When the problem is food, the parent should consider the likes and dislikes of the child for certain foods. Often that is a clue to what the allergic substance is. But in any case the decision should be made by a qualified medical expert who will consider all of the possibilities and design a diet or treatment for the child that will be both adequate and safe.

A child never wonders about the right and wrong of it—when he itches, his fingers go right to the irritated site. But an adult often

wonders if he should scratch. There is an old limerick:

There was a young lady from Natchez,
Whose clothes were always in patches,
When comment arose
As to the state of her clothes
She replied, "When Ah itchez, Ah scratchez."

There are obvious problems in scratching. In the case of poison ivy it can spread the condition. In eczema and hives it can break the skin and introduce bacteria, bringing on an overlying infection. In any case, it is wiser to keep hands off and treat the rash by other means. A doctor might prescribe antihistamines which will probably stop the itching and even make the swelling go down. When the respiratory system is involved, he may inject adrenalin. Severe cases can be controlled with hormones such as cortisone applied to the skin as creams or ointments. But none of these treatments which make the condition better really solve it. A careful study by an allergy expert can usually determine when an allergy is responsible and pinpoint the culprit. Then possibly by desensitization and avoidance the problem can be effectively countered.

As with any ailment that troubles man, allergies of the skin have brought their share of strange remedies, none of them useful but all of them part of the folklore. Some folks thought that you could prevent ivy poisoning by eating the leaves of the plant. That must have been a horrid experience for ivy sufferers. In addition to that, dozens of other herbs were rubbed on poison ivy rashes, probably making the situation worse.

Honey was once considered a medicine for respiratory ills, but since it contains pollen its use isn't advisable for persons with known pollen allergies—either eczema or hay fever. There are no remedies in the folklore which are as effective as modern medicines. If you or your child has a skin problem you should see a doctor. It may be an infection, or it may be an allergy, but only an expert will know for sure.

Some common sense advice for persons with skin troubles:

- See your doctor, who will refer you to a specialist if necessary.
- Keep the affected area clean and protected.
- Don't apply anything that would be injurious to normal skin.
- Ask your doctor which medicines can be applied to reduce itching. Sometimes an oatmeal or starch bath can help.
- Don't treat yourself with medicines unless you are told which ones to use by a doctor.
- Don't wear rough or irritating clothing near the affected area.

—Soap and water aggravate eczema, and so do strong ointments and lotions.

—Dry, heated air and sharp temperature changes also make the rash of eczema more irritating.

—Many local anesthetics such as cocaine or novocaine can cause contact dermatitis, so anti-itch drugs containing these pain-killers may aggravate the condition they are supposed to help.

—Keep your doctor advised when he gives you a drug that seems to cause unusual side effects for you.

The skin, for all the problems it encounters on account of allergies, is also a window for doctors to look for specific allergic causes. The skin is both a wall to the outside world and an intimate part of the body. The fact that one-third of the body's blood is at work within the skin at any given time testifies to that point. The skin also has a memory—in the words of one writer—of what the body as a whole has encountered.

For these reasons, doctors use the skin to test different agents to see if the skin recalls an allergic reaction to them. It does not provide the whole answer to the allergist, but it is often a valuable clue to the answer.

The skin tests are several. In the scratch test the skin is broken by a sharp instrument, and a small drop of the suspect material is introduced to the scratch. Sometimes the doctor may use a syringe to inject a small amount of the suspect material between the layers of the skin. Usually a scratch test is tried first, and an intradermal test will be used to confirm the results. If the body is allergic it takes the skin barely half an hour to respond. A small welt appears at the site of the test, and this tends to further implicate the agent that the doctor likely had reason to suspect in the first place.

If a doctor is looking for something you might have touched that caused your allergy the test is even more simple. A small amount of the suspected agent is applied to the skin and covered. In a day or two the doctor will check the site again for a reaction. If itching occurs before the regular check time, the test ceases then. It is an encounter with an allergen in miniature and usually shows what a person is allergic to.

Meanwhile, allergic or not, the skin goes about its myriad duties 24 hours a day, and hopes that the fool inside won't bring it any closer to disaster than it already is.

5



Death on the Wing

YOU CAN MAKE a nice, friendly case for pretty flowers. After all, they don't generally spread their pollen into the air to attack the hay fever or asthma sufferer.

But unfortunately they do—in all innocence to be sure—something much, much worse. Their brilliant colors and sweet smell are designed to attract the insects that will carry their pollen to other flowers and thence propagate the species. And the insects that they attract are some of the most dangerous killers in the world of nature.

Biologically, these lethal insects belong to the order Hymenoptera. They include bees, hornets, yellow jackets, wasps and fire ants. They all sting. And to the sensitive person the sting can mean death within minutes.

At least 30 Americans a year are killed by these stings. In fact the poisonous snakes in the United States look like peace-lovers by comparison. In one ten-year period, snake bites killed 138 people. In the same period, the lethal order of Hymenoptera dealt wild, stinging death to 229 people. Of these, bee stings killed 124, wasp stings 69, yellow jackets 22, hornets 10 and fire ants four.

There can be *no* delay in treatment for the sensitive person. Stings bring death so quickly that there is often no chance of getting medical aid quickly enough. The best treatment of all is, again, desensitizing

the sensitive person to the venom's allergic material long before the chance of a sting occurs.

The only member of the Hymenoptera family of stingers which apparently "thinks twice" about stinging is the honey bee. For the honey bee, to sting is to die, since the stinger and venom sac remains in the victim and tears away from the insect, causing it abdominal injury.

Another good defense for the sensitive person is to know the enemy, his habits and his habitats. So let's take a close look at the order Hymenoptera from the safety of the written word.

THE HONEY BEE

The honey-bee hive may house as many as 60,000 bees. This is a social bee living in a complex community. There are three kinds of bees—the queen, the drone and the worker. The worker or female bee is the one that causes the trouble, does most of the useful work in the hive, guards its entrance and ventures abroad to gather the nectar of blossoms. In the first half of its life, the worker cares for the hive and its other inhabitants. Later in the life cycle, it gets outside assignments.

It is when the worker is guarding the entrance to the hive that it is most dangerous. Its job is to defend the hive from outsiders, and whatever mysterious element in the social order sets up the assignment, it is devoted to its suicidal duty. The cartoon picture of a hive sending its total population out in pursuit of an intruder is not true. Most of the colony remains in the hive, leaving defense to the guards. Beekeepers know this fact. They divert the guards with smoke, and then open the hive and go about their work with a minimum of danger. Bees behave oddly after a smoke attack, returning to the hive to gorge themselves on honey. But colonies are unpredictable in their behavior; sometimes they are temperamental, sometimes docile—depending apparently on weather or other unknowns. One beekeeper recalls being actually stalked by a single guard bee.

A honey bee encountered in its nectar-gathering won't sting unless provoked, probably because instinct tells it that one sting is all it has. The honey bee will walk within the human cupped hand without stinging unless it is squeezed or otherwise bodily molested. Quite often children running barefoot get stung when they inadvertently step on a honey bee. But then who can blame the bee?

Other bees and wasps don't have such scruples. They sting often with little provocation, and they can sting repeatedly without danger to themselves. Other social bees besides the honey bee include the bigger bumble bees. But there are also solitary bees that live in family groups much smaller than the big bee colonies.

Among the solitary bees are carpenter bees which burrow in wood

to build their nests, mason bees which construct clay-like homes on rocks and cliffs, and miner bees which dig in the earth. The carpenter bee actually tunnels through wood, creating small chambers inside to house its young. Honey bees may use a man-made hive, or they may locate in hollow trees and caves. The bumble bee may create a wax nest underground, or choose the deserted nest of a small animal such as a mouse. Your garden or home can become the home unexpectedly of a honey bee colony looking for shelter. The bees swarm periodically and search about for a new shelter. Usually docile during swarming, they sometimes attack and have been known to kill a horse with multiple stings. It's helpful to know of a beekeeper nearby who will come out and retrieve the colony to add to his collection. If this isn't possible, the colony can be destroyed by an exterminator. Sometimes help might be sought from the county agricultural agent or the local fire department. The hives can often be difficult to reach, as for instance when honey bees set up housekeeping within the walls of your home. Certainly no one with a sensitivity should try to move a hive or nest, and no hive or nest should be permitted to exist near the home of a person allergic to stings.

WASPS

There are again social wasps and solitary wasps, but both types are dangerous to the sensitive person. The social wasps, such as hornets and yellow jackets, are easily disturbed and will sting literally at the drop of a hat anywhere near their nest-building activity. Their stings are sharp and painful. The reaction is quick.

The social wasps weave a sort of paper to construct their nests—processing old wood and fibers. The solitary wasps are similar to the solitary bees in the places they choose to live; they dig in the earth, burrow in wood and so forth. The solitary wasps provide food for their larvae in a unique way, stinging an insect victim with only a paralyzing dose of venom, and providing living nutrition for the young. One big wasp, the ichneumon wasp, carries this kind of parasitic life a step farther, usurping not only the nest of the wood-boring beetle, but using the beetle for food as well. The female wasp actually bores into a log to find the beetle's nest, then lays an egg in the tunnel. The grub hatches from the egg and feeds on the beetle.

The open comb nests of the paper-building social wasps are frequently seen around the home, under eaves or in any other protected open place. Sometimes the strong stream from a garden hose can be used to knock them down, or the handle of a broom, or a garden tool. Then it is wise to spray the area with insecticide for several days in a row to guard against a wasp's rebuilding in the same place. The yellow jackets which live in holes in the ground usually return to their nest

by dusk. By spotting the nest in daylight and marking it, the homeowner can return at dark and pour gasoline, kerosene or lye into the hole, repeating the procedure the next night to be sure he has destroyed it. Don't turn the stream of a water hose into the hole. The yellow jackets will pile out unaffected and attack anyone in sight.

The typical picture of a bee hive is usually the football-shaped hive of the hornet, hanging from the branch of a shrub or tree. Sometimes it can be reached by a flaming torch, or clipped and allowed to fall into a large container that can be quickly closed.

Again it can't be emphasized too strongly that no one with a known or suspected allergy to any of these insects should dare try to dislodge or destroy a nest or hive. He should instead seek help from a non-allergic person, or professional help from an exterminator.

One of the things that makes the order of Hymenoptera dangerous is their abundance—but a person can do much to limit that abundance in the area of his home. In the case of the fire ant, he can get assistance from the U. S. Department of Agriculture which has an extensive fire ant control program aimed at eradicating the ant in some areas and preventing its movement northward. The fire ant usually lives in mounds in open field. It propagates rapidly and has made some southern areas unusable for farming. It has a sting that gave it its name.

A sudden spit of fire describes the sting of most of the potentially lethal members of the order Hymenoptera. The venom is a mixture of noxious substances, which produce two kinds of reaction: an allergic reaction in sensitive people, and a toxic reaction when enough venom has been injected, usually the result of multiple stings. Besides these serious conditions, the venom also contains local irritants which produce the painful, burning, itching lumps and rash.

The reaction in allergic persons varies. In rare cases death is sudden. One sting may kill in minutes. In a ten-year study of insect deaths, the time element was measured in 208 cases. Death came in less than an hour in 80 per cent of the sensitive individuals.

But only a small percentage of the population is this sensitive. Far more people have lower sensitivity, or are gradually building sensitivity. In those persons who are moderately sensitive the range of symptoms is broad. The sting can cause a bad case of hives all over the body. There may be wheezing, dizziness, stomach cramps, diarrhea, vomiting, even faintness. Many note a tightness in the throat, and there are often respiratory symptoms short of wheezing—nasal stuffiness and difficult breathing, for instance. Joints may sometimes become swollen and painful. But most people show only a mild reaction, with swelling at the site of the sting.

An interesting study of beekeepers pointed up the unusual immunity that some people have to the stings of bees. Researchers from the

State University of New York at Buffalo drew extensive histories from 45 beekeepers—and the results do little to make the vocation of beekeeping attractive to the general population.

Two reported they were stung from 1,000 to 2,000 times a week, but the average number of stings was 50 to 100 times a week. In the spring when they encountered the first stings of the year, most reported they would get a small local swelling, but with additional stings after a week or so they would get no reaction at all.

Oddly, ten of the 45 beekeepers gave a history of an earlier allergy to bee stings, and three gave up beekeeping because of it. The ones who stayed with their bees have had no further allergic reactions. All in all, the researchers said, it appeared that in the course of their work the beekeepers had built up an immunity to the stings that the bees continue to reinforce with each additional sting.

Blood tests showed that almost all of the beekeepers had antibodies to either bee venom, or extracts of the bodies of bees, or both. Said one researcher: "We personally witnessed the sting of a beekeeper. All that could be seen was a sting puncture without . . . swelling. The bite of a mosquito is often more annoying than the sting of a bee to a beekeeper."

Hopefully, the researchers said, the beekeeper observations would throw some light on bee sting immunity that would be useful in treating sensitive individuals. Much needs to be known on just why insect stings produce allergic reactions. It seems clear that the venom acts as an allergen which stimulates the production of sensitizing antibodies in the victim. After repeated injections these antibodies are plentiful and react with the foreign protein in the venom. When sensitizing antibodies link up with such protein, the effect is not a neutralization of the injected material as would be normal. Instead, the linked-up protein material causes damage to cells, releasing chemicals that have wide and dangerous effects throughout the entire body.

Probably because more sensitized antibodies are produced with each additional sting, the sensitivity of an individual often becomes more critical with succeeding stings. It probably means that there is more antibody available to link up with more protein and produce a greater reaction.

It does not always take the sting of an insect to bring on the allergic reaction. Sometimes the dust of disintegrated insect bodies in the air and soil have brought on allergic reactions when either injected or inhaled. For just that reason some experts believe a person can gradually become sensitive to bee stings by merely working in his garden, without ever having been stung by a bee.

When an allergic person also has a heart ailment, he should be especially wary, since he is even more susceptible to the effects of the venom on his ailing heart.

There is also evidence that persons with other allergic disorders are

the most likely to be allergic to the stings of the order Hymenoptera and to stings of other insects too. There are some common proteins apparently in the venom of each of the stinging insects and this indicates that if a person is sensitive to the sting of a honeybee, he will also have a good chance of being allergic to the stings of others in the same family.

As we mentioned before, not all of the reactions from stings are allergic. There are also toxic reactions, when enough of the poison in the venom is injected. It might take 30 simultaneous stings, but the reaction can be as serious as the allergic reaction. The insect venom in large amounts destroys red blood cells and poisons nerve tissues. Pain radiates out along nerve pathways from the sting itself. It can cause anemia, nerve paralysis and bleeding. Massive attacks by stinging insects can, of course, kill, but this is highly unusual.

The preventive treatment for Hymenoptera stings is similar to the treatment for other allergies and sensitivities. First, skin tests and a careful case history by the doctor will spell out just what insect, if any, a person is allergic to. Often the patient has good reason to know he is sensitive to, say, bee stings, and he should see a physician without delay.

If the insect causing the allergy is known, then desensitization injections can be given. Extracts of the whole body of the insect are injected in slow stages, beginning with an injection equal to as little as 1/100,000,000 of a sting. Each succeeding dose is doubled to reach the point where protection is available to one or more stings. The doses finally level off and continue throughout the year. If the insect is unknown the doctor may resort to polyvalent extracts of four or more insects. Such materials are available covering the honey bee, bumble bee, wasp, hornet, yellow jacket, red ant and fire ant.

The desensitization series works. It develops useful, nonsensitive antibodies to bee venom. More serious reactions are halted after treatment about 97 per cent of the time, one study showed. Some individuals, who had the preventive shots and then discontinued them, were later stung by wasps or bees and remained protected. Others lost their protection in less than a year.

For some individuals, desensitizing treatment is not practical for a variety of reasons, and too often a doctor is not available in the critical minutes after a sting, so an insect-sensitive individual should know what to do to help himself. There are emergency kits available for these persons should their doctors believe they need them. Typically the kit might include a hypodermic syringe with adrenalin, an adrenalin or similar type inhaler, a tourniquet and antihistamine tablets.

The injection of adrenalin is the best way to counteract shock. The spread of the venom can be stopped by either the tourniquet or the application of ice to the sting site. The inhaler is used to combat

spasm in the bronchial tubes. The cortisone tablets and antihistamines which act to counter the inflammation usually do not work fast enough to be of use in an emergency. In any case the sensitive sting victim shouldn't waste a minute in getting to the nearest doctor or hospital for additional help.

We've talked about the well-known sensitivities to the lethal order of Hymenoptera, but there are allergic reactions to other insects and some water animals. Some people, for instance, are allergic to the salivary substances which a mosquito injects before it sucks out blood. These reactions are hardly ever severe. The same is true in the flea and other insects which can cause some skin irritations in children. Spiders and scorpions are well-known for their various toxic venoms, as are the jellyfish-like Portuguese man-of-war and stingrays of the oceans. But again, these produce toxic effects rather than true allergic reactions, and their poisons are nearly universal in their effects.

There are some things you can do about the home to lessen your exposure to the more common Hymenopterous insects. Here is a list of the things to check:

—Keep the garbage can clean and covered. Food attracts bees and wasps, as do the remains of outdoor cooking and eating. That goes too for the candy stick or ice cream left melting on the pavement by children.

—Be a cautious gardener if you are sensitive to insect stings. Too often you won't be able to see a wasp nest in a shrub you are trimming, or your lawn mower will uncover an angry band of stinging individuals, all looking for you.

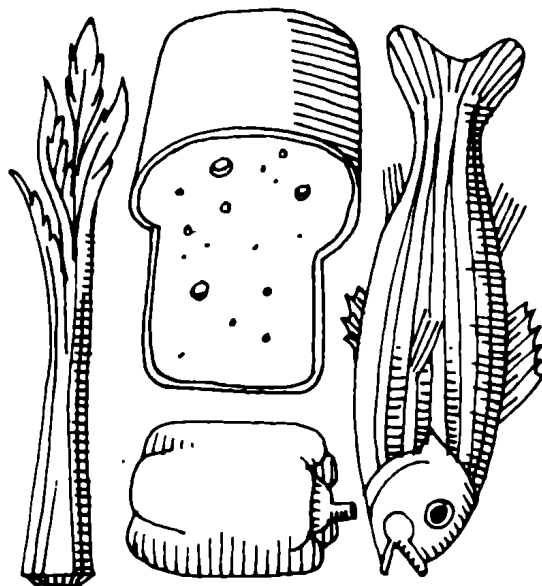
—Bright floppy clothing that might attract and trap insects should be avoided. So should sweet smelling cosmetics and hair dressings. If you can't afford an intimate relationship with bees, don't imitate flowers. Light colors are apparently the least attractive and the most innocuous to bees.

—Be careful moving wood and logs, lest you find a wasp nest. Don't kick dead logs in the woods, lest you shake up a wasp home and they retaliate. Stay away from open trash baskets or other areas where bees might be attracted.

—Don't wander around barefoot, unless you are looking for a sting on the bottom of the foot.

—Spray problem areas with insecticide and keep an insect bomb handy in your car should you encounter a potentially dangerous bee.

—If you are stung, get rid of the stinger quickly with a scrape of your fingernail. In this way you will restrict how much venom will flow into your body. It takes two or three minutes to get a full dose. Even with those insects that don't lose their stingers, get them off you quickly. Then, get thee gone.



The Dinner Table

SOMETIME IN THE century before the birth of Christ, the Roman poet-philosopher Lucretius, an Epicurean in thought, looked at the world about him and said: "*Quod ali cibus est alis fiat acre venenum.*"

Translated, it means simply, "What is food to one may be fierce poison to others." Whether he had heard it before, or whether it was his original observation, it has lingered in dozens of languages and is heard in form after form. "One man's meat is another man's poison," is a basic rule of the banquet table.

We all know people who avoid green onions or radishes or lamb or bread or Chinese restaurants or anything because, they say, "it doesn't agree with me." Indeed there are almost as many allergies to food as there are foods. Some foods are more common causes of allergy than others. Some are wrongfully accused of being allergic agents, when in reality the person is allergic to a seasoning used on the food and not the food itself. Yet food allergies are important, and they can cause a variety of allergic reactions ranging from asthma to hay fever to eczema to hives. In the digestive tract itself they can cause problems ranging from canker sores to vomiting, cramps and diarrhea. Furthermore, food allergies are not to be ignored—and, for that matter, not many people who have them would dream of

ignoring them. Experience has taught them to ignore the offending food instead.

Just how many people will have some allergic response to food isn't known. Some experts estimate that food allergies at some time bother one out of every two Americans. Certainly no other nation has available to it a greater variety of foods, processed by a greater variety of methods.

Even the smell of a food, or the small particles of a food in the air during cooking, can trigger bad reactions in extremely sensitive people.

There are recorded instances of children who break into wild asthmatic symptoms or the rashes of eczema from merely touching the shell of an egg, or being in the kitchen when an egg is dropped into a frying pan. Such sensitive individuals cannot so much as nibble at a cookie or a cake or anything that contains egg without feeling the sting of their allergies.

The French, with a predilection for fine foods and sauces, have a name for the most severe allergic response of the digestive tract. They call it "Grande Anaphylaxie." When a person eats the offending food, he suddenly vomits and becomes violently nauseated. His whole system rebels with severe stomach pain, sometimes with swelling and hives, diarrhea and, in some cases, quick death. This kind of severe reaction, however, is rare.

The run of the mill food allergy is a disagreeable, but rarely fatal, reaction. It causes serious problems only when it is allowed to interfere with good nutrition, or when it chronically upsets the digestion so that a person can't get the benefit of the foods he eats.

A look at the digestive system gives you an idea of how well organized this chemical factory really is.

Chewing your food, you also mix it with digestive juices from the salivary glands which go to work immediately on carbohydrates, breaking down starches to sugars. You swallow by the force of muscles such as the tongue. Indeed the teamwork of muscles around the digestive organs keeps the food moving through the entire digestive tract. The food travels through the esophagus into the stomach. There the powerful muscles in the walls of the stomach churn the food and break it up into small particles, even the food you were too much in a hurry to chew well. Meanwhile some 35 million glands that line the stomach add digestive juices that go to work on the food. There are enzymes to break down milk, split fats, and begin the digestive process on proteins. It may take up to five hours for the stomach to do its job.

The heavy fluid-like mixture produced by the stomach passes on to the small intestine, which operates in stations or sections along the nearly 20 feet of its length.

Here more digestive juices are added. From the pancreas come enzymes or chemical helpers to make complex sugar molecules into simple ones, and to break fats into fatty acids and proteins into amino acids. Bile works on fats to make them easier to absorb. Further along the small intestine much of these digested foods are absorbed by the lining, with the broken-down products of protein and carbohydrate going into blood vessels, and the products of fat going into the lymph system. Water is absorbed in the small intestine too. By the time the food mixture passes into the large intestine, there is little left besides waste and water. Now more water is absorbed, and the waste is passed out of the body.

At least, in simplified form, that's the way it should work. When an allergenic food is eaten, however, it raises hob with that whole orderly procedure. For some sensitive individuals the reactions might be immediate, and the organs that have been given the unfriendly food react immediately by throwing it out. This might happen just after the food is swallowed. In the mouth, contact may produce canker sores. There may be heartburn and indigestion. In the stomach and intestines, it can produce internal hives, cramps and diarrhea. Sometimes itching of the anus is caused by the passage of waste from allergic foods.

But suppose the digestive system tolerates contact with the allergic food, and absorbs it just as though it were harmless. Then the entire body may have to react to the still unfriendly chemicals that are admitted to the inner sanctum of the body including the circulating blood. The symptoms can be widespread and varied. The victim may break out in an eczemic rash, or he may have hives over his entire body, or an overwhelming, sometimes fatal, attack of asthma. His nose may become stuffy and irritated in an imitation of hay fever. The blood vessels may dilate leaving him with an unexplained headache. The eye may become irritated. There can be deep-seated giant hives that leave the victim looking like a swollen image of himself, or a closing of the swollen throat, sometimes leading to death. Some instances have been reported of food allergies that caused a swelling of the brain, and subsequent headaches.

Food allergies can mimic other ailments, making a proper diagnosis difficult. There are digestive allergies which mimic, for instance, the inflammation and infection of the peritoneum, the thin lining of the abdominal cavity and abdominal organs. The true condition, called peritonitis, can be fatal and requires emergency treatment. The mimicking allergic condition is considerably less serious.

Instances have been noted where allergies to foods caused more common ailments in the digestive tract. There have been reports of appendicitis attacks, peptic ulcer and ulcerative colitis caused by allergies.

Food allergies happen frequently in the young, and are highly important because youngsters have higher nutritional requirements for their rapidly growing bodies. In infants, allergy to foods often produces vomiting and colic. Sometimes a child's genuine dislike of a food may be the tip-off that he is indeed allergic to it and has symptoms he identifies with the eating of the particular meal. This shouldn't lead a mother into a greater indulgence of picky eating habits. It should lead her to a doctor when she feels that the allergy may be present.

The agents that cause allergies are usually related to one another. For instance, a child allergic to chicken will often also be allergic to turkey and duck and other fowl. People allergic to chocolate may also be allergic to cola drinks. Those allergic to radishes may have a kindred allergy to cabbage, brussels sprouts, turnips, cauliflower, broccoli—in short, the entire mustard family.

But sometimes seeming similarities between foods are misleading. It has been reported that foods which appear to be related often have biologic dissimilarities. If a person is allergic to strawberries, for instance, it doesn't necessarily mean that he will be allergic to all other kinds of berries. The strawberry isn't a berry at all, but a cluster of tiny plums. So the strawberry victim may be allergic to raspberries and other members of the rose family, but not to blueberries, cranberries and gooseberries. By the same token, a person who is allergic to peanuts may be able to eat walnuts and cashews without an allergic penalty, but is likely to be allergic to peas, lima beans, soybeans and other related legumes.

Other food items that seem to have a family relationship, but in truth are not related, are shrimp and oysters, potatoes and sweet potatoes, cabbage and lettuce, ginger and cinnamon, buckwheat and wheat. However, when foods are indeed related to others, an allergic person can count on this rule:

If a person is allergic to one, he is allergic to all the rest.

Another way in which allergy and food are intertwined is in the general care of the allergic patient. The asthma patient and the hay fever patient may be given drugs that help them rid themselves of mucus but also encourage vomiting. Sometimes the amount of mucus taken in by the patient through a persistent and fluent post-nasal drip will also encourage vomiting. That in itself means that the patient is losing most of the value of the food he has ingested.

Sometimes too an allergic condition affects the digestive tract to make it more mobile, hurrying the digesting food mixture through before the full benefit of it is realized. This means that even when the patient is eating a satisfactory diet, he may not be getting its full benefits.

Add to these points the obvious one that a patient suffering from a severe allergy often suffers a loss of appetite, and it can readily be seen how important is the proper intake of food.

Accompanied by all of this is the possibility of more frequent infection in the allergic person, and the importance of a proper diet is accentuated still more. It may mean that the allergic patient needs vitamin supplements, and a diet designed to insure that the essentials of life and growth are available.

Vitamins, however, are no cure for allergies. When vitamins are used, it is desirable to have them prepared synthetically rather than from natural sources.

Some experts feel that the availability of vitamins in the allergic child might actually have a therapeutic effect. But whatever the viewpoint, it is obvious that the vitamins are essential to health, and that general health is an important factor in the treatment of the individual with an allergy.

For example, vitamins A and D, the prime fat soluble vitamins are both important in the well-being of skin cells, which are often hit by allergies and are the body's first line of defense. The body produces vitamin D when the skin is exposed to sunlight. In the growing child, this might not be sufficient, however, and added vitamin D may be needed to enhance bone growth and to work with other vitamins to maintain the integrity of the tiny blood vessels called capillaries. These smallest of the blood vessels, incidentally, are primarily responsible for the fact that one-third of the body's blood supply, at any given time, is in the skin, providing nourishment and removing waste products.

Among the water soluble B-vitamins and vitamin C, there is scarcely a question of importance. Vitamins B-1, B-2, niacin, B-6 and B-12 are important in maintaining the health of, variously, the capillary system, the skin, the digestive tract, and the nervous system. Vitamin C is important in its effect on the capillaries, and the soft tissues of the body. It is a vitamin with many effects, even reaching to the hormone system of the human organism.

Deficiencies of these important helpers in life can mean serious disease. For the person who has problems that interfere with his nutrition, supplements of these vitamins are needed. Only in extremely rare cases is there a problem of allergy to synthetic versions of the vitamins that are now available.

We can see then—overall—how the body might rebel at some foods, and yet it requires that the essentials of food be provided it. When an allergy steps in and denies the body important elements such as the life essentials—proteins, fats, carbohydrates and vitamins—trouble can occur.

Good medical attention can solve the problems.

When the individual is allergic to foods, an expert in this area can help find the cause. Of prime importance to the doctor is the history of the case and the interview with the patient or his parents. Skin tests are not always as reliable a guide in allergies to foods as they are in other allergies.

Perhaps the doctor will decide to use an elimination diet, allowing for a brief time a few non-allergenic foods. Then gradually he will add ordinary foods to the diet, one at a time. When one causes an allergic problem, it in effect points a finger at itself. That item is dropped from the patient's meals at that point, and a new food is tried. This process goes on until the full spectrum of foods is determined.

The detective work begins with a complete history of each case, a complete physical examination, and investigation aimed at uncovering any generalized disease, infection or parasitic infestation. There are also extensive laboratory examinations of blood and waste products, and skin tests, when indicated.

Armed with these data, doctors can either eliminate the allergenic offender, or desensitize the patient if some inhaled allergen is responsible. In one study of 75 patients, 55 with chronic hives had a personal or family history of allergy, and therapy worked well in 54.

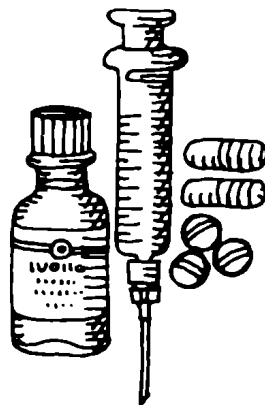
Just because a food is eliminated from the diet for allergic reasons does not mean that the patient will never be able to eat it again. Some foods, for some individuals, can be returned to the normal diet sometime after the initial trouble is found and solved. But the immediate solution will probably mean dropping the problem food from the diet.

There are innumerable foods to which a person may be sensitive. Some rare individual may be sensitive to many of them, others to a few. At any rate, whatever his allergic response, he will require the advice of a doctor on a diet that will serve him, yet not be his poison.

Many times a patient will have no difficulty discovering which food he is allergic to. Yet some foods remain hidden in other products and cause an allergic reaction for which the entire product takes the blame. One of these is corn, which is present in some 130 products. In one group of 50 patients, skin tests showed that half of them were allergic to corn; their condition improved on a corn-free diet.

Salad oils cause similar problems, since they frequently derive from such sources as corn, peanuts and cottonseed. Pastries and cakes made with cooking oils from these sources can cause unexpected and severe allergic attacks.

One young lady had an immediate and overwhelming attack after one bite of a corn muffin made with peanut oil. She spit it out at the first taste of the oil but it was too late. Only the quick application of first-aid techniques saved her life. By the time she called her doctor, the worst was over.



The American Medicine Cabinet

IF YOU WERE a hypochondriac, and had a medicine cabinet big enough, and could get the necessary prescriptions, you could probably go broke buying the 900 or so drugs commonly used in the United States to fight disease.

Chances are, you'd also find some among them that you were allergic to.

Drugs are more powerful and more plentiful than ever before. Most of the serious infectious diseases have fallen before the power of antibiotics and sulfa drugs. Scores of tranquilizers have helped control the mental and emotional anguish of patients who otherwise would have had to spend years in mental hospitals. There are 54,000 fewer mental patients in state and local hospitals today than there were in 1955. Death rates have been cut in innumerable diseases, and the life expectancy in the 1960's is near 70 years, about ten years longer than it was in 1930.

Drugs of every conceivable description have worked these wonders. And new drugs are added to the U. S. medicine cabinet at the rate of nearly 40 a year. More than 600 made their appearance between 1941 and 1964. Add to these the vaccines against polio, measles, whooping cough, various respiratory ills, diphtheria, tetanus, smallpox and, as

appears likely soon, mumps and three-day or German measles.

Yet, because all this is strong medicine, there is, behind its use, the possibility that a patient may be sensitive to the very drug that is needed to preserve his health. Consider:

A mother of four children comes down with a sore throat and fever. Her doctor decides it is a bacterial infection, and prescribes penicillin. She begins taking the antibiotic according to instructions. She's had penicillin before, and she knows its effectiveness. But on the second day she has difficulty swallowing. She can barely talk. Her neck muscles are sore, and her throat is extremely painful.

She doesn't know why, but she is practically in tears with pain and frustration. The doctor checks the throat again. The signs of infection are minimal. Yet his patient is in real difficulty. He decides she is, or has become, allergic to penicillin. He stops the medication and substitutes a sulfa drug. Within 12 hours, she notices the improvement in her throat. She can swallow again. Within 24 hours the pain and all that went with it are gone. Almost certainly the throat clogging effects were due to the penicillin.

She knows now that she is allergic to penicillin, and her doctors are forewarned too. Her reaction was not totally uncommon. Faced with a growing sensitivity to penicillin among patients, many doctors prefer to hold off this extremely effective antibiotic until it is really needed. It is effective against a broad range of micro-organisms that other antibiotics can't touch. Yet it can cause a variety of ailments from a skin rash to nearly instant death in individuals who become sensitive to it.

Nor is penicillin alone. The area of allergy to drugs is becoming increasingly important. Some individuals show a sensitivity to tranquilizers and some to anesthetics, some to aspirin, and some to the candy-flavorings used to make pills and syrups more palatable or the gums and other materials used to bind the drug. Even some anti-histamines used to curb allergy symptoms in a wide number of cases bring out the special sensitivities of some individuals. Some people are allergic to iodine applied to a cut, or mercurochrome, or even an adhesive bandage.

There is literally no end to the number of possible allergies in the medicine cabinet, nor is it likely, for that matter, that effective drugs will ever be devised that won't cause symptoms of allergy for someone, somewhere, sometime.

Some individuals are even allergic to vaccines—either to the medium the vaccine was prepared from, or to the bactericidal agent itself or to its poison. Let's look at the nature of drug allergies, what their effects can be, and what can be done about them.

First, a drug by definition is a substance used to treat disease in human beings.

That, of course, covers almost any chemical, serum or other substance that fights or prevents infection, and the dozens of drugs used to treat symptoms.

Sometimes drugs have a toxic effect on an individual. This is not an allergic reaction. Sometimes it is an exaggeration of the effect the drug is supposed to have; that is, the patient responds so readily to the drug that it seems as if he has been given an overdose. Whatever the drug was supposed to do, it does much too well in this given person. It usually happens quickly and it may happen again if the drug is given again. But the body does not respond, as in an allergic case, with sensitizing antibodies to the drug. Nor is a prior sensitizing to the drug a requisite before the reaction occurs. It can happen with the first dose.

The *allergic* reaction to drugs follows the same pattern that other allergies follow. It doesn't come with the first encounter, and the individual requires at least an initial dose to become sensitive to the drug itself. But when the allergic reaction occurs, it can do so with a vengeance.

There are essentially three kinds of allergic reactions to drugs. The first and most severe is anaphylaxis and anaphylactic shock. The body has a severe reaction to something in the drug, usually a protein. It happens quickly. The patient goes into shock, and sometimes dies.

The symptoms may occur almost immediately or up to 30 minutes after the drug has been injected or ingested. The patient is suddenly uneasy and anxious. He may be struck with a sudden, throbbing headache. Death sometimes comes so quickly that symptoms don't appear. The cause is often a collapse of the blood circulation system and the seeping of blood serum into the lungs. A doctor may give skin tests and other examinations to determine whether a person has such a sensitivity before trying large injections of a drug. If the reaction occurs, he may fight it with injections of anti-inflammatory drugs and adrenalin.

The reaction is not always that severe, although it is almost always rapid. Injections of the offending drug may result in an asthma attack, a sudden breathing difficulty, hives or an irritation of the nose and throat passages.

A second kind of allergic reaction to drugs is serum sickness. This reaction is usually delayed as the body builds up its response. But it can be a serious reaction nonetheless. It occurs some time after the injection of an animal serum, which perhaps carries an anti-toxin the patient needs. But the sensitive patient reacts much as he would to some other animal substance such as skin or hair. He may suffer from joint pains, weakness, fever. His lymph glands may become swollen, as well as parts of his body. And he may suffer from a condition that looks like hives.

Some individuals are sensitive just to the touch of some drugs. They

suffer a poison-ivy type of reaction—rash and itchiness, and skin eruptions.

Even puny amounts of a drug can cause an allergic reaction. The reaction might take as long as two weeks to show itself, or it may occur within minutes.

The sensitivity to a drug is not likely to just go away. It tends to increase with the daily dose of the drug, and with any increase in dose. And just because a person has been able to take a drug without reaction before does not mean that an allergic attack may not come with the next dosage. Persons who are on drugs for long periods of time will probably encounter a reaction within the first six weeks if a reaction is going to occur. Generally not as many reactions occur to an oral drug as to the same drug administered by injection, or topically to the surface of the skin. In fact there is a higher incidence of allergic reactions to drugs used on the skin than to any other means of administration. Patients already suffering from severe skin eruptions tend to be more sensitive to medications used on the skin.

And, as in other allergies, a person who is already sensitive to one or more allergic agents is more likely to develop a sensitivity to drugs than is a non-allergic person. Still, save for some diseases like asthma, doctors have not been able to establish a clear genetic link for drug allergies.

Drug allergies can cause a number of unusual reactions in the blood, bone marrow and soft tissues of the body.

Take the case of persons sensitive to anti-malaria drugs such as quinine and quinidine, to disease fighters in the sulfa family and some antibiotics, oral substitutes for diabetes-controlling insulin, tranquilizers, or antihistamines. They may suffer from a reduced number of blood platelets, the grayish bodies in the blood that appear to aid in blood clotting. The reduction leads to small hemorrhages in the skin, and to easy bleeding as well.

The same drugs have been known to reduce the number of white blood cells in circulation. This makes a person more prone to infection, and is sometimes fatal.

Another condition sometimes attributed to drug allergies is aplastic anemia, a chemically or otherwise induced failure of the bone marrow to produce blood cells. It has been caused by sulfa drugs, insecticides, weed killer solvents, and at least one antibiotic and anti-arthritic drug. Other forms of anemia have also been associated with drugs.

Actually almost any part of the body can be affected by drug allergies. Doctors have noted an inflammation of the blood vessels, and some say that liver damage may occur due to sensitivity to tranquilizers and other drugs, including sulfas, antibiotics and gold salts.

Fever commonly accompanies a drug reaction, and can be caused by anti-malarial drugs, sulfas, antibiotics, preparations aimed at con-

trolling high blood pressure and high thyroid activity, and many others.

Frequently the lungs and the bronchial tree are also involved in drug allergies, and some drugs have been known to cause an inflammation of the heart muscle.

Penicillin offers doctors a particular problem. There are many new microbe fighters in the doctor's armament, but penicillin is still the drug of choice in many diseases. Yet, if a person has had a past history of penicillin allergy, doctors are wise to be wary of a possible anaphylactic reaction to a new encounter with the drug. Considerable progress is being made in designing new skin tests to determine whether persons are sensitive to penicillin. Some tests show promise of exposing at least those persons who will suffer the immediate, severe reaction. The difficulty with skin tests is that they cannot generally use the drug itself without triggering a severe reaction even in puny amounts. Sometimes, however, skin or scratch tests are made using very low concentrations of certain suspect drugs. Different approaches using drug breakdown products rather than the drug itself show some hope. Patch tests, using drops of drugs, are commonly used to pinpoint drugs or chemicals suspected of causing contact dermatitis.

Relatively rare are drug reactions to various vaccines. The allergic reactions to these weapons of immunology may be to the active element in the vaccine—the tetanus toxin or the diphtheria toxin, for instance. Or it may be to some element used in the vaccine production—egg material in which a virus was grown, horse serum from an antitoxin or penicillin used to preserve the vaccine.

Tetanus antitoxin, generally made from horse serum, can bring allergic reactions in patients with a history of horse asthma or an allergy to horse hair or dander. A skin test can determine the horse allergy, and then a tetanus antitoxin with a bovine or preferably human base can be substituted for the horse serum.

The possibility of reactions to penicillin used earlier as a preservative in Salk polio vaccine has prompted some manufacturers to change to other antibiotics. Some severe reactions to vaccines have been traced to the use of silk filters used during vaccine production.

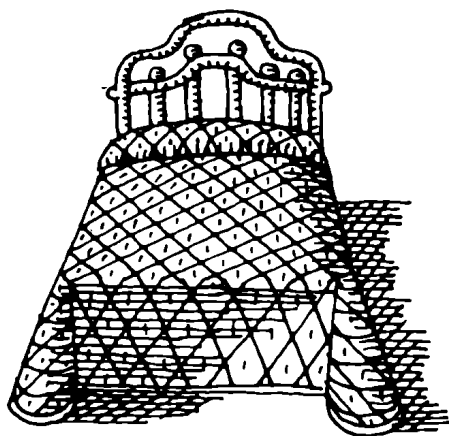
Continued efforts of manufacturers to make their vaccines more and more pure is reducing the already rare allergic effects from items used in production.

Much can be done to help the patient suffering from allergic reaction to a drug. Prompt diagnosis will shorten the illness. The patient's cooperation and help is essential. A doctor may prescribe a drug in his office and not expect to see the patient until a week later. It is a foolish patient that suffers an untoward reaction and doesn't notify the doctor immediately. If the doctor decides it is the drug, he can

discontinue its use, substitute another that will clear up the basic medical problem, and also prescribe something to fight the more uncomfortable effects of the allergy.

Allergic reactions to drugs generally clear up within two days after the drugs are discontinued. This generally tends to confirm the suspicion that it was the drug that caused the trouble in the first place. When that happens, the doctor can note on the medical record the sensitivity to that drug, and prevent its further use. This is important because the next reaction could be more severe.

Some groups have suggested that persons carry on their person not only a record of their blood type, but a card showing what drugs they are allergic to. It could save their lives should they for some reason be unable to communicate with an attending doctor. Undoubtedly some lives are lost needlessly after accidents when good medical treatment is available, but the patient is unconscious and unable to tell doctors of drug sensitivities.



The Beauty of Home

TO MOST PEOPLE, the beauty of home is that when they are there, there usually isn't anywhere else they have to go. Home is the end of the road, the place where a man can take off his tie and shoes, change into his shorts or some comfortable slacks, read the afternoon newspaper, have a drink if he wants one, look forward to dinner, read or watch television. It is a good place. To a child, home is safety and love, a place to take friends or a place to get away from them, a place for an afternoon snack, a good place. To a woman, a home is a place for pride, and a place to share, and most often a family to be proud of and to share a home and love with. To her, too, it is a good place.

And because a home is all of these things to all of these people, it is hard to understand that it, or things in it, can also poison them. In other words, sometimes for some people, it is anything but a good place. And that's what we're going to talk about now.

No housewife yet, with all of the modern household weapons at her command, with all of the time in the world, has ever been able to make her home completely free from dust, house dust. The reason is simple. If you were able to weigh a house all together, and weigh all of the dust and potential dust in it separately, very likely the house wouldn't have a very big edge in weight. Of course, that's just a guess.

But look, for instance, at that cement floor in the basement. Does it shed dust to the rest of the house? Look at the clothes dryer. Even though it is vented, how much of the day's wash is trapped in the dust trap and how much isn't? And the living room carpet? And the rest of the carpets and rugs? And the upholstered furniture? And the insulation in the ceiling? And the paint on the walls? And the food you cook? And the cigarettes you smoke? And who knows what else?

House dust, a curious mixture of goodness gracious knows what, is a serious cause of allergy.

If you suffer from some unexplained but year-around respiratory problem—a long-term stuffed-up nose, sinus, even bronchitis and asthma—maybe you're allergic to something in your home. Or anybody's home. The doctors call year-round hay fever allergic rhinitis, which means simply an inflammation of the nasal passages due to an allergic cause. Too often the cause is house dust.

What is house dust really? Well, maybe its feathers from a pillow. Maybe it's a fine sort of lint from carpets, drapes or clothing—wool or cotton. Maybe it's bacteria from somewhere, perhaps molds, maybe it's something the kids brought in, or the dog or the cat, or tiny bits and pieces of wallpaper, or paint or other people in the house.

House dust can be so many things you'd have to have a complete catalogue of your world to figure out what is in it. And you can't blame the wife, because over the years there is bound to be more dust than she can handle.

But, nevertheless, when your doctor considers what you are allergic to, he'll consider house dust, whatever it is. He may even want to get some of it to test whether this is a cause of your allergy.

Because house dust contains so many things, it can, over the long run, be the answer to a lot of mysterious allergies. Skin tests might be able to tell the doctor if dust is the culprit. But first maybe we ought to consider some of the different things in your home that can contribute to dust. Let's go from room to room.

THE LIVING ROOM

Most of the things in this room we've already mentioned: the carpet, the drapes, the sofa, horsehair stuffing or other animal hair, chair upholstery and stuffing, the paint on the walls, or the plaster. Do you have a fireplace? Does it contain a bed of ashes most of the winter? Unfortunately, all of these contribute to the home's inventory of dust. How about house plants? They're pretty, but do they drop off allergens to plague someone there? Does the dog or the cat like to curl up in a comfortable chair? Pets lead an outdoor life and bring many things home you'd never dream they carried on their hair. And even that hair, or scales from their skin are potent and frequent allergens.

THE KITCHEN

Spices come from plants and herbs mostly. Some of them are potential allergens to some people—whether they are inhaled as dust or eaten as food. Then there are cooking oils that atomize under hot flame, and there are food particles because there usually is a combination of food and children. And . . . well, it's something to think about.

THE BEDROOM

This room is where a person spends most of his day, and when you really figure it out, where he spends nearly one-third of his life. If it has a television set, most people spend even more time there than that. That's why it is particularly important, so far as house dust goes, to the allergic person. If you, or someone in your family, has a house dust allergy, this room should be cleaned up of all but the most essential furniture. Are there upholstered chairs or other stuffed furniture there? Take them out. Get rid of dust catchers, including pictures on the walls and knick-knacks. Don't keep bookcases or venetian blinds. Even toys should be kept elsewhere. Use plastic, nylon or glass fiber curtains, and small washable rugs. Wash all of them frequently. Out with plants and flowers and cosmetics, including after shave lotion.

THE BATHROOM

If an allergic person is using the bathroom, keep cosmetics elsewhere and keep the room as free from dust as possible.

Now it isn't easy to keep a dust-free room, much less a dust-free house, but the dust can be kept to a minimum in places where the allergic person might have the greatest contact.

Some tips:

- Keep floors cleaned and waxed.
- Dust ceilings and walls and floor tiles frequently.
- Wash whatever can be washed—including the bedstead and springs and slats. Don't forget the backs of dressers. Whatever you can't wash, dust with a damp or oiled rag.
- Clean radiators and behind them.

Think you're done? Well, not exactly. What about clothes in the closet? Sorry to say, they're part of the room too—if they're in it. Clothes that you don't use often, or clothes that you wear outside, should be taken from the closet and put in another room.

Now don't think you have to do this every day. You'd probably wear out both the bedroom and yourself. But in all seriousness, it should be done four times a year. And every day the room should get a light cleaning with damp cloths and oiled mops. Keep doors and windows closed when the room isn't being used.

It sounds like a lot of work, and it probably is, but for a person whose allergy builds into an asthmatic case of wheezing and labored breathing, it is certainly worth while.

When you buy clothes and pillows, it is best to think of what possibly allergic materials there are on the market, and avoid them. The Allergy Foundation of America recommends using 200 per cent count percale sheets for bedding, and banning woolen or fuzzy blankets or comforters unless they are zipped into a washable blanket cover. Avoid chenille or quilted bedspreads; silk often causes dermatitis, so avoid it too. Use a tightly woven, washable material that you know your patient is not allergic to. Some synthetic materials like nylon dynel and acrylan are coated with a finish which is sometimes a cause of skin reaction. However, these materials may be used if the patient is not allergic to them. Woven cotton is generally all right. But cotton stuffing for pillows frequently contains cotton seeds which sometimes raise sensitivity.

For mattresses, the best protection, regardless of composition, is an air-tight plastic cover. If box springs are cloth covered, they should be further zipped up in allergy-safe covers.

The pillow is an intimate part of the bedding, so extra care should be taken with it. Feathers make an excellent stuffing, but they also produce a fine dust to which many people are allergic. Avoid them. Some pillows are stuffed with kapok, which also produces dust and cannot be washed, and should be avoided. Synthetic, washable fiber stuffing is all right for the allergy patient's pillow. But the pillow should be covered with a dust-proof casing. These dust-proof covers are excellent for traveling, since you can put a hotel pillow inside one and cover it with an ordinary pillow slip.

By the way, if you have twin beds, both beds should be made allergy-proof.

While we're in the home, let's look at the heating plant. The worst you can possibly have—from the allergic patient's point of view—is a space heater. They are hard to clean and hard to keep clean. Next on the list of less-than-desirable heating units is the forced hot air system. If you have one, clean the air filter once a month, and replace it once a year. Cover the hot air registers with coarse muslin, and seal them off completely when the heating system is not in use.

The best heating system for the allergic patient is the hot water system. Let's look at the reason.

Winter air is generally low in moisture content. Force hot air systems further reduce the humidity, and since they force the air through

the house they also force dust with it. Hot water systems also reduce home air humidity, but not as much, and they avoid the dust problem. If the air is too dry, moistened cloths can be hung on radiators or open basins of water can be placed near the radiators or on them. There are also room and home humidifiers available on the market.

The lack of humidity not only increases the amount of house dust in circulation, but it tends to affect the bronchial passages as well. Some experts think this accounts for the increase in both allergic asthma and respiratory infections in the fall when home heating units come on again and the air turns drier.

As we mentioned in an earlier chapter, there are large air purifiers using electrostatic charges to trap dust that can be built into forced air heating units or into central air-conditioning systems. But before shopping for either of these devices, or for full house humidifiers, you should seek expert advice. It may also help to consult friends who may have purchased such devices. At any rate, you should shop carefully.

Pollen is easy to control in a local area in the home during the pollen season. The best device for this control is an air-conditioner. Window filters can remove pollen, but are no help against dust, molds, bacteria and other potential allergens.

The best treatment for a patient allergic to sensitizing agents in the home is a medical treatment. That means skin tests to find what the agent or agents are. Then comes desensitization, small doses of the allergen until the body can fight off attacks of the allergen when it encounters it. Even if desensitization is reasonably successful, the situation may be controlled by less than the stringent household cleaning we have described.

It is nearly impossible to keep a home dust free, no matter what the effort. But there are some rather simple aids that will make necessary housecleaning easier, and some tips for the allergic patient who finds things in his own home that he can't live with.

—Be sure the allergic member of the family is elsewhere when you're cleaning the dust out.

—Vacuum cleaning is the best way to trap dust. Be sure to vacuum radiators and air vents before the heating season starts.

—Don't dry sweep. If you have to use a broom, drop some moist bits of paper generously over the floor area to control the dust you might raise and spread.

—If you are doing the cleaning and are allergic to house dust, wear a nose and mouth mask. There are several kinds available—some in dime stores. If you have a choice, use a vacuum cleaner that has a filter pad or blows the dust through water. Too often a housewife comes down with an attack of hay fever or asthma while she's housecleaning.

—When dusting, use an oiled cloth, or use one of the many prepara-

tions that hold down dust while you dust. Remember, you can harm wood-grained finishes with water-moistened dusting rags over a long period of time.

—There are also available some oil in water sprays that can be applied to carpets and upholstered furniture to hold down dust. Since much of this dust is otherwise uncontrollable, this is the preferable method.

—If you use home insecticides, and most people do, avoid using those which contain the dried and powdered flower of the pyrethrum plant, DDT and paradichlorobenzene. Many allergic persons who inhale this substance have acute reactions. Other things to avoid: moth balls, paints, other strong chemicals. There are some insecticides that are made especially to be less allergenic than normal.

—If you are sensitive to dust, stay out of dusty places. Let someone else go up to the attic or the storeroom. Think twice before you go to the library. Maybe someone else can do it for you.

—It may seem cruel, but if your child is allergic, it is best to keep him away from cuddly toys, especially furry and stuffed animals. Wood, metal or washable toys are better. And if your child or someone else in your household has allergies, it probably means *no* pets.

—Let an allergic child play in his own bedroom, which you've cleaned carefully for him, or let him have the use of a clean, bare play room. Don't let him play on rugs or upholstered furniture.

—If you're going someplace for the summer, remember that cottages, closed up much of the year, gather molds and dusts, and these can be a serious hazard for the allergic patient.

In talking of house dusts, we have mentioned molds only briefly, but they are an important allergen both inside and outside the home. A mold is a hardy fungus that lives in damp places. It propagates by sending seed-like spores into the air. It is actually the spores or seed molds that are often the allergic offender.

There are some areas in the home where a person is likely to encounter these tiny organisms. They are usually damp places like the kitchen, the bathroom and the cellar. If you have an allergy and smell mildew or see mold growing in these areas, your doctor should be notified. He may want to make a skin test for mold sensitivity.

One way to keep the basement free from molds is to keep it dry. That means venting the clothes dryer. It means perhaps using waterproofing compounds on the cement floor and walls. There are some good and inexpensive methods of dehumidifying the basement air too. This area—and perhaps the attic as well—should be painted with either casein paints or paints containing fungus-killing materials.

As you can see, to the allergic person, his home is more than his castle. It must be a rather special castle, a little cleaner than the castle next door.



The Air

THE DARKENING CLOUDS begin usually in the autumn in most American cities, right on the heels of the hay fever season. You could call it the smog season.

The President of the United States estimated that air pollution costs the nation one billion dollars a month. But for individuals with breathing troubles the cost can't be measured in money. The only measure for them is in damage to their vital capacity.

Among them are some three million Americans with allergic asthma, and many more with a sensitivity to some of the chemicals and gases that flow into the air from chimneys and automobile exhaust pipes.

Just how severe is air pollution in the United States? In urban areas it has become a plague more difficult to escape than ragweed pollen. It is everywhere potential, and when it strikes it hugs the narrow layer of air in which people live.

Smog is created by a silent, wispy conspiracy between two forces. First there are the tons of waste from the thousands of fires that feed a city energy for its many tasks. Second, there is the weather. The smog-creating condition in the sky is called a temperature inversion, and it can happen almost anywhere—but some places are more susceptible than others.

In a temperature inversion, a layer of warm air forms over cooler

surface air. In normal conditions, the air's temperature and density decrease with altitude, providing a natural avenue of escape for air heated at the surface. It allows smoke borne upwards by hot air from a smokestack to rise high enough to be dissipated by winds. But the warm air layer in a temperature inversion acts as a lid on this normal rise of air and smoke, and generally the area below the lid fills with smoke, a stagnant pool of gases and chemicals in a shroud sometimes less than 500 feet in depth from ground level.

It can happen when a warm air front moves in over a cooler air mass. Or it can be created by the rapid cooling of the earth on a clear night. In this last case, the most beautiful of fall skies actually creates the problem. After a fair and pleasant day, night comes with a clear, star-spangled sky. The earth cools rapidly, radiating its heat spaceward. At the same time the layer of air immediately near the ground cools too, more rapidly than air above. Again the warm air layer is formed over cooler ground air. The next day dawns clear—but the sky doesn't have a chance. There is an invisible lid over the city, and perhaps by noon the city is choking in its own debris.

The weather conditions are easily understood, but, just as with rain, snow and storm, man hasn't learned how to do anything about them. The other conspirator in smog manufacture he can control—smoke.

Few Americans realize just how much gaseous waste is pumped into the air by the nation's smokestacks and automobile and airplane exhausts. It is estimated that there are one quadrillion tons of air over the United States. Into this aerial wastebasket, the United States sends over 130 million tons of waste each year.

Consider these facts: On any weekday in freeway-laced Los Angeles, 3½ million automobiles burn seven million gallons of gasoline. This means that more than 10,000 tons of exhaust gases and unburned gasoline vapor are released into the Los Angeles air. The result is what air pollution experts call the raw materials for Los Angeles type smog. Some 80 per cent of the city's air pollution comes from its automobiles.

In Chicago, the automobile contributes less. There are about a million cars in the city, and more in the general area, but there are also about 50,000 smokestacks, and one of the nation's most concentrated industrial complexes on the city's southside. To keep its people warm in cold weather, to provide electricity, to keep factories running, the city burns annually almost nine million tons of coal, 765 thousand gallons of oil, and 176 billion cubic feet of natural gas.

All of this burning produces almost 570,000 tons of sulfur dioxide and 142,000 tons of particulate matter—soot dust. It goes the only place it can go—into the air.

Luckily for Chicago, it has one of the most ambitious and efficient air pollution control programs, and will greatly restrict the amount of debris it sends skyward in the years ahead.

The remarkable differences are how much waste is produced by the different fuels. Coal, for instance, produces 88 per cent of the sulfur dioxide and 98 per cent of the dust in Chicago's air.

Generally, however, the automobile is the great contributor to air pollution in the nation, creating 40 to 65 per cent of the aerial debris. New exhaust control devices will over the years cut this percentage down to size.

Smog differs from area to area over the nation, depending on the kinds of fuels burned and the number of automobiles present. The so-called Los Angeles type smog is highly irritating to the nose and throat areas. It is a product of hydrocarbons and oxides of nitrogen from auto exhaust which, in the presence of sunlight, enter into a photochemical reaction in the air.

Another general type is the so-called London smog, which contains a greater amount of air-borne dust and large quantities of sulfur dioxide from coal and oil burning. Sulfur dioxide and water unite to form sulfuric acid, but *no* one has been able to say exactly what damage this does to the respiratory system except in extremely high concentrations.

Those concentrations occur, however, with greater and greater frequency in many cities, thanks to temperature inversions and greater use of fuel by a greater number of people. Los Angeles, for instance, could have gone on forever without a smog problem, ignoring the very idea of temperature inversions over the Los Angeles Basin, if it had not become the home of so many people.

Its first real experience with smog came in 1943, when, bustling with war industry and an increased population, it suddenly was producing more smoke than its air could cope with.

Medical experts are only now beginning to plumb the effects of smog, both the long-term effects and the acute, short-lived effects.

London, England, beset by stagnant air and fog sometimes in winter, has suffered two serious smog attacks—in 1952 and 1962. Both came in the month of December. The first was nearly five days long, and the air was dank and dark with a heavy fog. When officials checked death statistics for the city a few months later they found that in a seven-day period beginning with the smog attack the city had counted 4,000 more deaths than would normally have occurred in that period. And most of these added deaths were due to diseases of the heart and respiratory systems. A similar conspiracy of weather and smoke in 1962 produced 400 excess deaths in the city.

Across the English Channel, in Belgium's heavily industrialized Meuse Valley—again in December, in the year 1930—another smog attack occurred. It lasted about a week, and was similar to the London episodes that were to follow. Foggy, wet air and smoke stagnated over the area, thanks to a temperature inversion. Thousands fell ill with

coughing and shortness of breath, and 60 persons died, most of them among the elderly and those with prior heart and respiratory disease.

In the United States, the industrial town of Donora, Pa., was struck by a smog attack in late October, 1948. Donora is barely 30 miles from Pittsburgh, located in a deep river valley. Again, the weather conspired to create a temperature inversion over the valley. The air became immobile. Fog formed, and the city's smokestacks took care of the rest. The dense, wet smog covered the town for some four days before rain cleared the air. But in those four days, 17 persons died, an excess of 15 above the normal death rate. Again the elderly and people with pre-existing heart and respiratory ills were the victims. Many, many more became sick with coughs, sore throats, breathing difficulties, headaches, irritated eyes, nausea and nose irritations. Doctors performed autopsies on five of the victims, and found in three of them severe lung irritations, abnormalities of the blood vessels in the lungs, including bleeding and swelling, and clogging of the large and small bronchial tubes with mucus.

The second London smog attack reflects some of the things that can be done when you know an attack is coming. The death toll was one-tenth the earlier attack because Londoners were advised to stay indoors if they had heart or lung ailments, and those who had to go outdoors wore handkerchiefs or gauze masks over their faces to keep out some of the worst of the air pollutants. The attack was also somewhat less severe because the city had taken measures to control its air pollution problem.

The fact that these incidents are widely cited as examples of air pollution damage too often makes them seem unique. They probably aren't. It is likely that other smog attacks occur with some regularity over the nation, but are either short-lived or in some cases are not investigated to see what effects they have had on health.

The bigger question is one that haunts many investigators now: What are the effects on the respiratory health of people over a long-term exposure to air pollution that is minor in comparison with the heavy smog attacks?

There are many studies underway, and the bits and pieces of evidence are being accumulated. But little is known for certain. One reason for this is that people live in complex environments with many forces acting on their health at any given moment. It is hard to separate the ill effects of one agent in the environment from the many ill effects that modern man creates for himself. The smog crises that struck London and Donora seem to show that even those who survive the attacks may have poorer health afterward. And that makes the question of the chronic effects of air pollution even more important.

How air pollution affects the allergy-sensitive person is part of the larger question, and with present information, inseparable from it.

Many studies in the United States, England and even the Soviet Union show that air pollution over the long haul is associated with a higher rate of respiratory disease.

The range of respiratory disease is broad. It extends from the common-cold type of nasal difficulty at one end to the devastating effects of lung cancer at the other. In between there is a variety of ailments ranging from chronic sinus trouble to long term bronchitis and asthma to emphysema, the long-term ailment that steals the efficiency of the lung.

One common denominator of all these ailments in relation to air pollution seems to be this: The irritants in air can stymie the normal cleansing mechanisms in the respiratory tract. They restrict the movement of the hair-like cilia that line the bronchial tubes, much as cigarette smoke is reputed to do. They may also cause abnormal production of mucus in the nasal passages and sinuses, and an abnormal condition in the throat. All of these damaging factors can lead to an increased susceptibility to infection, and may in some cases trigger an underlying allergic sensitivity. One study of two groups of people who lived in different sections of a Maryland town showed significant health differences between them coincident with air pollution data.

The individuals in the part of town where the air was fouled by pollution and dust had a higher incidence of colds or cold-type symptoms.

Investigations in England, Japan and the Soviet Union also show correlations between air pollution and diseases of the respiratory tract. The Soviet study of two towns, one with cleaner air than the other, showed the town with high pollution levels had a higher rate of acute respiratory disease than did the nearby, cleaner town. But whenever air pollution conditions are taken into the laboratory where animals can be studied under controlled conditions, it is difficult to find clear-cut answers. However, in one group of studies animals exposed to air pollution showed an increased susceptibility to an induced lung infection than did kindred animals not exposed to air pollution.

The U.S. Public Health Service indicates that evidence is good that air pollution is associated with chronic bronchitis. Studies also show that more people with bronchitis die during times of air pollution increase. A combination of community studies and laboratory work with animals shows that the bronchial passages seem to constrict with exposure to the irritants in air pollution. But just what irritants are responsible, whether they work together, and how they manage to reduce the airways to the lungs are still a subject of study.

Air pollution both aggravates allergic asthma cases and seems capable of producing a sort of synthetic asthma in those persons with *no* known allergies or history of the disease. The fact that it can bring on severe attacks in known asthmatics is clear beyond a doubt.

Doctors have recorded outbreaks of asthma in New Orleans when light winds brought in polluted air from trash dumps where fires still burned underground. When the smoke was analyzed, it was discovered that some of the airborne particles were produced by the burning of plant material. The asthma victims were skin tested with this material and showed a reaction to it, proving fairly conclusively that the plant material in the smoke was triggering the sudden asthma outbreaks.

Additional detective work has pinpointed air pollution as the factor bringing on attacks in known asthmatics in both Nashville, Tenn., and Pasadena, in the Los Angeles smog area. No one knows just how it works, but it does. Smog is bad for asthmatics, just as it is for others suffering from respiratory ailments.

The Donora smog disaster speaks to the same point in clear terms. Of that town's 14,000 residents when the smog struck, 340 had known allergic asthma conditions. Fifty-seven per cent of these asthmatics had severe reactions during the smog attack, and 88 per cent in all showed some effects. These percentages were far higher than the percentage of non-asthma sufferers made sick by the smog.

There is no question of the importance of the factor of air pollution in these attacks of true asthma. But air pollution also seems to be able to manufacture a sort of synthetic asthma too. U.S. military personnel living in an industrial smog bowl near Tokyo developed asthma symptoms even though they had no allergic history. When they left the area, the symptoms cleared up. When they returned, the symptoms were even worse. Some who stayed in the area had serious lung problems such as emphysema after even a few months of this synthetic asthma.

Just as emphysema can follow chronic, untreated allergic asthma, it apparently also follows the synthetic sort of asthma.

Breathing is difficult enough for the person suffering from emphysema, but smog and other air pollution makes it nearly impossible. Remarkably some victims of the disease who live in smoggy areas improve dramatically when they are kept in air-purified rooms.

Just what it is in air pollution that acts as the primary irritant is still an open question. A study in Genoa, Italy, indicates that sulfur dioxide is an important factor in generating the symptoms of chronic bronchitis. Some have accused sulfur dioxide on the grounds that it forms sulfuric acid when it interacts with water. Although the chemical reaction is known, some scientists question whether the blame can be placed on this one chemical.

One study showed that the nasal passages, as part of the air filtration system in the human body preparing air for use by the lungs, absorb almost all the sulfur dioxide inhaled. But only 15 per cent of the sulfur dioxide taken in is released again by the nasal passages. Somehow the body has the capacity for retaining 85 per cent of the

sulfur dioxide it breathed in. The study did indicate that less than 1 per cent of the sulfur dioxide inhaled got through to the rest of the respiratory tract, but that amount could be enough to trigger changes in the bronchial tree.

There were other interesting questions raised by the study. Perhaps if the mouth rather than the nose were used for breathing, the amount of sulfur dioxide reaching the lungs would be increased. And if the sulfur dioxide and dust were breathed in at the same time, the dust particles might carry more sulfur dioxide down into the bronchial system.

But there are other elements to air pollution as well. Auto exhausts produce large amounts of carbon monoxide. There are high levels of hydrocarbons too, and oxides of nitrogen, and, in photochemical smog, irritating levels of ozone.

The total effect of these combined irritants may be greater than the effect of any one or a few. The fact that the amounts of individual irritants vary from city to city may also be a factor in how severely they affect those with respiratory illnesses.

Certainly the person with an allergic asthma or bronchitis or nasal allergies has an interest in lessening air pollution in his community. Perhaps only in extreme cases does his life depend on it. But the course of his ailment, and his hopes for eventual health are tied to every breath he takes. He has a greater than average interest in the community air he breathes.

Progress in controlling air pollution comes slowly. If Los Angeles had not begun a stringent air pollution control program in the 1940's as it did, say federal officials, it is likely *no* one would be able to live in the mountain-rimmed basin below.

Pittsburgh began in the 1940's to control smoke from its industry and was able to reduce it by two-thirds by 1960. Los Angeles, with more dire problems, has been able to hold its own despite explosive growth. More cities, such as Chicago and New York, are now working on tighter pollution controls, and areas that never seemed likely places for pollution, such as Denver, Colorado, and the state of Montana are awakening to the fact that pollution can be a fact of life anywhere. The truth of the matter is, pollution can be a fact of death anywhere too.



A Breath of Youth

THE PICTURE OF a sickly, bed-ridden invalid, laboring for every breath, needing constant care, is the awful specter haunting every parent of an asthmatic child. Actually it shouldn't.

More and more, there is no valid reason to shunt the child with asthma into a half world, confining him to a bed, depriving him of the fun and the thrills of being young.

By the old-fashioned classic notion, there are probably no two words further apart in connotation than football and asthma. Football conjures up the image of a rugged, quick human being, his whole body attuned to action, his mind on the fine edge of movement, his endurance tested by contest after contest. Asthma conjures up exactly the opposite. The asthmatic child, wracked by tortured breathing, exhausted by the wheeze in his lungs, afraid of living and afraid of death, is a pitiful sight for the mind to see. The asthmatic child, it would seem, could be no poorer equipped for football if he had been born without hands.

Sadly, some asthmatic children are created in the form of this image, because they have not had the proper treatment and the best of care, or, sometimes, have had too much pity.

But 13 young boys in Denver gave the lie to that kind of image.

They were asthma victims. But they won the football championship of a local eight-team Chamber of Commerce league, going undefeated in seven games! The boys were in the 10 to 12 age group. The game was tag football—like touch football except that you have to rip a plastic tag from the opposing player to tackle him. Since it was a small team, the boys played both offense and defense. They represented a rather unusual organization for football—a children's asthma treatment center. More important, they won against boys who never had to fight the difficult breathing of asthma, or the image that goes with it.

It was a kind of edgy situation when the season started. The first game was played in the rain and cold of a fall day. It was an experiment, and it could have blown up right then and there. The score was heartening—the asthmatic boys won 13–7—but it didn't really prove anything. But for the rest of the year, all the way to the championship, the boys had no unique problems because of asthma. They just kept winning, and feeling better and better about it. The confidence of winning bred enthusiasm and the enthusiasm bred winning.

Yet when they were first admitted to the center most of these same boys had serious asthma; some of them were almost in the invalid category. Obviously, they had improved greatly before they ever got to the football field—but why? They had expert medical care, lived in cottages that were designed to be allergy-free, played in other sports, went to public schools and had psychological advice when necessary.

Not that this was unique. It isn't. There are similar programs elsewhere in the nation, experimenting with the use of exercise to help the asthmatic.

In Kansas City, Missouri, one more rehabilitation program for asthmatic children is breaking the chain of disability and inferiority felt by the young asthma victim. With weekly sessions to teach breathing exercises, general athletic activities and swimming, four-year results are good to excellent. The child is also encouraged to take part in activities with other children of his age and size.

In another study of 12 severely asthmatic children sent to camp for one to two weeks, most of the children responded with less dependence on medication and an increased ability to take part in competitive sports.

The old notion was to reduce the activity of the asthmatic, hold him down to control the amount of stress placed on his breathing. At one time it may have been the best idea for the chronic asthmatic. There were no effective drugs and sometimes ineffective treatment. Perhaps resignation was all there was.

At another center, doctors have been working on a carefully controlled program of exercise for asthmatics, some adults and some teenagers. They knew that some asthmatics who went against doctors' orders for inactivity seemed to feel better, seemed to have a better

mental attitude. Some doctors doubted, though, that the physical condition had actually improved. It was decided to test this phenomenon.

From 39 patients who couldn't be helped outside a hospital the investigators formed two groups. The ages ranged from 15 to 35; all of them were asthmatics. One group was put into an exercise program—an hour of calisthenics, another hour of sports like basketball. The other group led a rather quiet and normal hospital life.

The staff kept a careful watch on both groups, including full medical records, treadmill endurance tests and breathing functions. After three months, the groups switched roles, the unexercised becoming the exercised and vice versa. Two out of three patients improved under the exercise regime in terms of how much exercise they could handle, and three out of four showed they could increase their intake of oxygen. But not only that, the benefits of the exercise continued for at least three months, and none of the asthmatic patients had a downturn in condition during the exercise period.

As researchers told a medical meeting: "Physical conditioning may be indicated for a large number of patients suffering from asthma, in an attempt to increase the usefulness of their lives."

All of these exercise regimes, when carefully controlled and coupled with effective medical care and allergic countermeasures, seem to show that the asthmatic child can escape his role of the past.

Of the large numbers asthmatics in the United States, most of them experienced the beginning of their problems as children. Asthma is not unescapable in all cases, and it can be controlled in most cases with good medical care. The two accomplices that enhance asthma are neglect and pity.

Of these, neglect is the worst in the sense that it lets a child fall into the hands of a thief who might never have had the chance to steal. But first, let us look into this most serious of childhood allergies, and see where it leads the child.

Allergies, as we have seen, are generally explained by heredity. That is, the allergic patient has someone in his family past who has also suffered from an allergic condition. It need not be the same allergic condition—merely any allergic condition. If a grandparent suffered from an allergy to dogs, the granddaughter might suffer from an allergy to pollen. If an uncle had eczema and hay fever, his nephew might have asthma.

Besides the hereditary base, doctors have noted a personal history of allergies in individual cases. They have seen cases of eczema in infancy lead to hay fever in childhood, and hay fever in childhood lead to asthma in adolescence. Sometimes they have seen eczema and asthma erupt together in infancy. Sometimes they have tried to treat a child with asthma, only to learn that earlier he had a kind of hay fever that went untreated.

Asthma, as we saw in Chapter 3, is an extreme difficulty in breathing, accompanied by coughing and wheezing. Sometimes it strikes in limited but sharp episodes. Sometimes it is a constant condition that abates and then grows worse but afflicts the patient all the time.

It is often at its most dangerous when it afflicts babies. When it hits, it may seem only a small cold. But it moves, and it moves rapidly. The parents are largely unaware; it is the last thing they expect. But suddenly the baby's breathing is difficult, and there is an audible wheeze. The infant's stomach begins to heave in his frustration at not being able to expel air. If the parents check, they find that the breathing now is rapid, but shallow. The heart rate is extreme. A case like this without medical attention in time can lead to death.

In this kind of acute episode, hospital care is necessary. At home, the best the parent can do is provide humid cool air for the child—and call a doctor. In the hospital, the baby can be provided with cool, humidified oxygen, and the proper medications. A baby's heart—still getting used to the idea of life—can take only so much added stress.

In actuality, asthma is caused by an irritation in the bronchial tubes that feed air to the lungs. There is a spasm about the muscles surrounding the tubes, and a narrowing of the tubes themselves when the irritation causes a swelling of the delicate lining. Finally, there is a thick and ugly mucus. The wheeze is produced by air trying to get through these tortured passageways, the cough by the automatic attempt to clear the passageways.

If a lack of medical attention in the infant can be fatal, it can be severe too in the older child. A large number of asthmatics can become chronic cases with even more severe conditions of the lung—with a barrel-chested deformity of the rib cage and a permanent shortness of breath. This kind of crippled breathing is the ailment that produces the asthmatic invalid. In World War II, some 37,000 soldiers were discharged with asthmatic disabilities.

To believe the child will just outgrow his asthma without medical care is like betting on a longshot who is left at the starting gate. Sure, it is possible, but there is just too much at stake to take the chance. It is better to give the child with asthma proper medical attention and avoid the possibility that he will become a breathing cripple.

Allergy is the most common cause of asthma in children. It is the invasion of a foreign body like pollen that stimulates the defense mechanisms of the individual to produce antibodies against it, and the kind of sensitizing antibodies in allergy that affect individual cells. In these cases, a number of chemicals are released that produce the inflamed response of asthma.

The foreign invader might be inhaled as a pollen or a mold or the dusty remains of an insect. Or the inhalant might be house dust, or

the dust of feathers, or dogs, or cats. In children, the culprit is often some allergenic food. Sometimes even the breast milk of the mother might carry an allergy-causing agent from food she has eaten. Fish, beans, nuts . . . the list of possible allergenic foods is endless.

But these are not the only causes of asthma. A respiratory infection can always lead to asthma in a small child or an adult. Sometimes an allergy sets up the perfect breeding ground for a respiratory infection; sometimes the infection is the only cause of asthma. Bacteria in the tonsils or adenoids can be the very thing a child is allergic to. But even strong chemical odors can produce an asthmatic attack, and sometimes heat, cold, fatigue, or a rapid change in the weather.

No one can say for certain what the emotional or psychological factors in asthma might be. True, the emotions do not exist alone. They frequently stimulate physical effects in the human body—the secretions of some hormones. But even in allergies as a whole, it would be difficult to point to an emotional cause with any certainty. That does *not* mean that there are not emotional effects from allergies, asthma included. The pitied child with asthma, over-protected by his parents, feeling that the only thing between him and distress is some form of drug—this child can have all kinds of emotional repercussions. For this reason, psychiatrists often can help a child pull out of the emotional difficulties that arise from his physical ailment.

The emotional manifestations of this kind of disability don't always mean a withdrawn individual. Sometimes an asthmatic child may become hostile and aggressive, sometimes a rebel against the society he lives in. And in turn, doctors have seen instances where the emotional trials of asthma can in some instances worsen asthmatic attacks.

Children have every right to expect better than they often get in the case of asthma. If they have the ailment, they should still be treated as children, not as invalids. By the same measure, they should get adequate medical care. The earlier they are treated, the better their chance of rising above the disease.

The problems that allergies hold for children are, of course, not limited to asthma. In the infant, the problem is frequently eczema, and this can be a sorry condition if left untreated or treated haphazardly by the parent.

Eczema is one of the most common of childhood allergic reactions. It may begin as an itching rash on the face or the neck. Sometimes it occurs in the folds of a baby's skin, under the neck, behind the knees, or on the elbows. Most cases of eczema—especially mild cases—disappear all by themselves. But when a case persists, it breeds at the site of irritation; its symptoms are an itchy, thickened skin—sometimes discolored—and always enough to make the child irritable, disrupting his normal life and eating habits.

Often eczema returns after disappearing in childhood, and it may

come back with an attack of hay fever or as a harbinger of coming allergic problems. Sometimes it never disappears, persisting to create embarrassment and isolation for a boy or girl growing into the teens. Sometimes it spreads wildly over the child's body.

Hay fever is another allergy that affects children, as does the sort of year-round hay fever called allergic rhinitis. The stuffed-up nose, sneezing fits, inflamed throat and mouth are the discomforting symptoms that bring on sleepless nights and irritable days. Since seasonal hay fever may strike in spring or summer, it can often incapacitate a child in the season when he should be healthiest and most active. Since the ragweed season comes in the fall when school starts, it can often start a child off on the wrong foot in the classroom and with his friends. And lest you think that hay fever is a casual ailment, remember that it sets up its victim for further infection, including sinus trouble and hearing loss. And one out of three hay fever victims can expect to develop asthma in time.

Hay fever in itself is a misnomer. It is caused most usually by pollen. But mold spores and the disintegrated bodies of certain insects can also bring on attacks. Summer hay fever, sometimes called rose fever, is again misleading. It isn't caused by roses at all. It is caused by the pollen from grasses such as blue grass and timothy. Spring hay fever is caused by the pollen of most of the common shade trees. Fall hay fever is generally caused by pollen from ragweed which grows in wild profusion in the United States, especially in the east and the middle west.

There is a kind of year-round hay fever too, but the chance that it is caused by pollens is slim, although they may play a part. More likely the child with year-long nasal distress is allergic to house dust or some other allergen such as the feathers in a pillow that is around all the time.

Children are candidates for other allergic skin ailments such as hives and are prone to many of the contact dermatitis poisons such as poison ivy.

Not infrequently the child just had too much strawberry shortcake and breaks out in hives. Or, because he is in one of the most active periods of his life, he is more likely than adults to stumble into a patch of poison ivy. Still there are some serious food allergies, and the parent whose child has skin or breathing problems after eating some foods or has digestive troubles with some regularity should seek medical attention. It may be a functional difficulty; it could be an allergy.

There is no reason why the life of the allergic child has to be drastically changed. Sometimes the cause of year-round hay fever can be removed from the home or the environment. So can some causes of asthma. A doctor may decide to try skin tests to pinpoint the allergen by placing small samples of suspect allergic material under

the surface of the skin and waiting for a reaction. The parent and child can help too by giving a complete history of the case. By a number of these techniques, the doctor can usually find what agents the child is allergic to. Then the agent may be removed, or if practical, the child may be desensitized to those things he is allergic to. Desensitization is usually effective. To alleviate the symptoms of allergy in the meantime, there are a number of drugs that the doctor can prescribe—from antihistamines to fight off the inflaming chemicals in an allergic reaction, to adrenalin-like sprays to help clear the throat and bronchial tubes. Room air filters, air-conditioning systems and home humidifiers sometimes are prescribed by the doctor to counter house dust and pollen. In severe cases, there are cortisone drugs to alleviate the worst of the symptoms. But these should never be used without a doctor's specific instructions.

The truth is that much can be done for the allergic child today with adequate medical care. Only the foolish parent leaves to time what medicine can do now, and what possibly time can never cure.

The fate of the allergic child—even the asthma victim—today is one of hope and activity, if the child is given half a chance.

The best the parent can do is try to build both the physical and emotional health of an allergic child, while protecting him from the extremes of climate and living that he would protect any child from. Over-fatigue, under-nutrition, these are the bane of a healthy life in an allergic child or a non-allergic one.

Exercise is showing promising results as a way to normalize the life of the asthmatic child, increase his breathing potential, and give him a more normal outlook on the world. But, again, the doctor should prescribe how much exercise is advisable in an individual case. The allergic child cannot rise from his bed after months there and go directly to the basketball court or the Little League ball field. His exercise-capability will have to be built up gradually.

Just as likely, an asthmatic child will have a greater than normal tolerance for the routine of calisthenics if he knows it will lead him out of the bedroom and into the outdoors again.



Allergy: Disease in Disguise

FOR CENTURIES, ALLERGY hid behind the skirts of other diseases. It lurked in the pool of human misery unrecognized from the other ailments it mimicked. And it might have remained hidden for years longer, had it not afflicted some doctors who bit by bit found the symptoms unique to special times of the year, and linked to special foods on the table.

The earliest doctors, Hippocrates, Galen, Celsus, gave us words like asthma and eczema from the language of the Greeks. Asthma meant short-drawn breath, and eczema came from words meaning to boil out. But as diseases they described everything from troubled breathing to leprosy. Such was the natural confusion of the first men to try to treat disease and chart its symptoms.

The word allergy itself is derived from the Greek words meaning "changed work," and it was indeed the "changed work" of the body that produced allergies. But the cloak of infectious disease hid the nature of allergies from discovery and special attention until the last century, although keen medical eyes spied hints of its presence as early as 400 years ago.

Perhaps the first solid hint came from a doctor at the University of Pavia in Lombardy about 1565. He described symptoms of nasal

distress that he said were caused by the smell of roses. And almost like an echo from the Roman philosopher Lucretius, he discouraged the then wide use of colognes because what was pleasing to many might be harmful to one.

But the hint was hardly recognized by other medical explorers of the time. Man was rediscovering his world and his body, learning how infections were transmitted, finding secrets of the blood's circulation, learning how fertilization takes place, cataloging the species of earth. There was not much time for subtleties, and allergy within the framework of disease was a subtlety.

A century passed with little or no mention of diseases that might be allergic in nature. But in the late 17th century, Dr. Jan Baptista van Helmont, a Flemish physician and chemist, recorded cases of asthma that arrived with the summer and disappeared with winter. The victims, he said, also developed skin rashes coincident with their troubled breathing.

Still it remained for the biological explosion of the 19th century for man to finally strip the mystery from infectious diseases and to see that some remarkably singular symptoms seemed to have other causes.

Early in the century, an Englishman named John Bostock, troubled since childhood by a summertime distress of eyes and nose, described the case fully in all its misery: itching, sore eyes, irritation of the nose and sneezing. It was, he thought, caused by the summer heat or sunlight. But he could find only 28 other cases in England. Within a decade, a fellow Englishman, Dr. William Gordon, described a similar ailment, decided it was caused by the odor of grass and flower, and dubbed it "hay asthma." By now the use of the phrase and its kindred label "hay fever" was becoming popular. It was a patient's self-diagnosis that led another Englishman, Dr. John Elliotson, to tag the pollen of grass as the responsible agent in hay fever and link pollen to a skin rash as well. Then he reported that similar symptoms could be caused by exposure to animals.

By now the idea was spreading and medical experts in several nations were arguing whether summer heat or pollen caused the symptoms of hay fever.

Perhaps the best organized and researched work of the time was produced by the English doctor Hyde Salter. He studied many asthma victims, showed that the condition could be caused by skin and hair dust from a cat and other animals, found that some foods could trigger asthma attacks, and suggested that the disease could be passed on by heredity.

It was a vase of grass and Dr. Charles H. Blackley's own hay fever miseries that gave him the clue to begin a long series of experiments that eventually proved the case for pollen. He found the vase, put there by his children, in a seldom-used room, and accidentally dis-

turbed the pollen from the blades. It sent him immediately into a hay fever attack.

In America, other doctors were finding that a widespread weed caused hay fever symptoms in the fall. But all of these men trying new-found experimental techniques to pinpoint the cause of distress in their patients were not unopposed. There were others who laid hay fever symptoms to emotional problems and to bacteria.

It was a bacteria-conscious world, struck by the experiments of Louis Pasteur and Robert Koch. The idea that disease was caused by living organisms within the body was overpowering, and it did much to obscure the nature of allergies, a nature which today seems as obvious as the nose on our face.

But while the discoveries of Koch and Pasteur were responsible, in part, for temporary confusion about allergies, they developed the scientific methods which were eventually to conquer infectious disease and provide a pathway for proof in other diseases like allergy.

It remained for a Frenchman and a large dog named Neptune to uncover the basic process that creates allergies. The Frenchman's name was Charles Richet—a man who wanted to be a writer and had two plays produced in Paris, but then was pushed into medicine against his will by his family. Richet was a remarkable man. In the year 1890, he built himself an airplane, or what was intended to be an airplane.

But two years earlier, he discovered something unique in rabbits. He took blood from dogs suffering from a bacterial infection and injected it into rabbits, succeeding in making the rabbits immune to the same bacteria. It happened by luck. He had been trying to transfer tumors from a dog to a rabbit. Following up his surprising discovery, he found that the fluid serum alone could transfer immunity.

Because of his active imagination and wide interests, it was not strange to find Richet, just after the turn of the century, aboard the yacht of the Prince of Monaco, heading for the Indian Ocean to investigate the poisonous sting of the Portuguese man-of-war. Nearly every ocean bather is familiar with this tentacled creature sailing the waters with its sheer blue balloon riding above the surface. Its sting is harsh, sometimes fatal, causing the body to swell painfully. Richet sought to give small amounts of man-of-war poison to dogs, and in doing so make them immune to the poison altogether. It had been done with other poisons.

He returned from the voyage with a good knowledge of man-of-war poison, but he had not finished his work yet. Borrowing poison from another sea denizen, the stinging nettle, he injected dogs with a small amount of it. A week later, working with "a fine large dog called Neptune," Richet prepared a second dose, a tenth as strong as a killing dose.

At nearly the instant of injection, Neptune became violently ill, and in minutes began to stagger under the impact of the puny shot of poison. Then the dog keeled over and died. Richet was shocked. This was not to be expected. There was no reason. But he was not a man to doubt his eyes, or let a mystery go untouched. He began a new research pursuit, aimed at uncovering the strange cause of sudden death. By 1902, he reported that a number of substances that were not harmful at first meeting could be disastrous at second encounter. He called the strange occurrence "anaphylaxis," a word he coined to mean "without protection."

He had set out to prove that living creatures could be immunized against violent substances, and produced instead a condition in which he had robbed the creature of its protection. He had aimed at prophylaxis, or protection, and he had discovered anaphylaxis, the lack of protection.

Yet this second chance discovery of the way sensitization occurs won him a Nobel Prize, set up the basic rule of allergy, brought back the oft-disclaimed nature of hay fever and asthma, and laid a milestone in the new science of immunology.

It did not answer the question of how sensitization occurs, however, and that is still a prime subject of immunologic research.

Richet worked with poisons. But relatively early in the 19th century the same condition had been produced in an animal by the injection of egg white. And other researchers, contemporaries of Richet, had produced similar results with blood serum from animals.

The work of Pasteur and Koch, meanwhile, had stimulated widespread research into the nature of micro-organisms that cause disease, and ways of developing immunity against them. In 1885, Pasteur injected nine-year-old Joseph Meister with weakened rabies virus extracts and protected the boy from the bite of a rabid dog. Almost a century earlier, Dr. Edward Jenner had vaccinated an eight-year-old boy named James Phipps against smallpox by using extracts of a similar virus material, cowpox. And all of this happened without any real knowledge of viruses, or any agent visible to the microscope.

It was a German doctor, working in Koch's Berlin laboratory before 1900, who tried a different immunologic idea. Emil von Behring decided to try infecting animals with a disease, then reaping protective antitoxins from that animal and injecting these into humans to transfer immunity. It would, he thought, avoid the danger of actually giving a human being an infectious agent. He produced antitoxins for human use to both tetanus and diphtheria. The animal that proved the best factory for this kind of work was the horse.

Two pediatricians, Clemens Von Pirquet and Bela Schick, followed this work carefully. Schick, a Hungarian by birth who later became a U.S. citizen, discovered the Schick test for susceptibility to diphtheria.

The test is simple: Diluted diphtheria toxin is injected into the skin, and if there is no reaction, it means the patient has enough antibody to fight off diphtheria when exposed. If he doesn't have enough antibody, the site of the injection becomes inflamed. Inactivated toxin is injected at another site to be certain that the individual doesn't have an allergy to the proteins in the solution, giving a false positive reaction to the toxin.

Schick and Von Pirquet, who was for a short time professor of pediatrics at Johns Hopkins, noted that sometimes patients given diphtheria antitoxin developed other symptoms, ranging from fever and aching joints to swollen glands and extensive hives. Sometimes a patient died after injection. The two men, born within three years of each other, checked into the strange happenings, and found that their patients were not reacting to the antitoxin but to the serum of the horse that carried the antitoxin!

Von Pirquet coined another word for this remarkable byproduct of diphtheria research. He borrowed the Greek words "allos," meaning "other" or "changes," and "ergon," meaning "work," and constructed the new word "allergy." They called the condition "serum sickness" and labeled it an allergic reaction. The body, they said, became super-sensitive to a material after first exposure, even if the dose was tiny. It was a reaction akin to the anaphylaxis described by Richet. It was not entirely by chance that the science of immunology gave birth to the new science of allergy, for they had their roots in similar reactions.

Immunology is based on protection against disease by introducing disease agents into the body. The body recognizes these as antigens—that is, foreign invaders that stimulate its reaction. The antigens coax the body into producing antibodies which then inactivate the antigens.

Allergy is an accidental reaction with the same general scheme. Again foreign antigens invade the body, which recognizes their presence and prepares antibodies against them. But while immune antibodies protect against antigens by neutralizing them, sensitizing antibodies do not. Indeed, when the antigens make a second invasion of a sensitized individual after a period of time, the reaction is less than normal. Perhaps the antibodies formed by that first meeting cling to the very cells of the body. Perhaps they have recognized more than one enemy. At any rate, they are not protective. They are even harmful. The antigen enters the system again. The antibodies formed by the previous meeting engage the invaders. But in the process, what happens?

One theory is that the sensitizing antibodies link up with the antigens and that the cells are injured in the process, leaking out vital chemicals like histamine and acetylcholine. While these chemicals have important functions when controlled by the body, their free and uncontrolled presence actually does damage to sensitive tissues.

Researchers are probing the ways in which these chemicals and others can produce inflammation in the body. They have shown that histamine can increase the permeability of blood vessels, allowing them to leak out fluids and proteins. Histamine also makes blood vessels dilate. Normally histamine is found throughout the body, but its major reservoir is in the mast cells, and these can release relatively large amounts when prodded by outside agents. Scientists have found histamine at the sites of inflammation—at the scene of the crime, so to speak. Other body chemicals have been shown to cause pain in the skin, and other effects.

Another theory holds that the irritations and the blood vessel expansion are caused not by the direct action of some agents at the site—but by the destruction of agents that would normally make blood vessels constrict. Scientists are trying to find out just what the role of adrenalin is in the refereeing of inflammation.

There are, said one expert, many chemicals which can be rationally explained. “However,” he added, “the pieces . . . seem randomly placed in the puzzle box, and it will be many rainy days before they fit together for a clear picture of the mediation of inflammation.”

Meanwhile, other scientists are probing the nature of antibodies, how they are formed, and how they recognize and design themselves for specific invading antigens. Researchers are finding what appears to be new and subtle colors in the rainbow of antibodies carried by the blood. The globulin portion of the blood is the residence of the body’s circulating antibodies. But now that part of the blood is beginning to yield some of its secrets.

At the same time, doctors have recognized and are studying patients with less than normal amounts of antibodies in the blood, and some with virtually no defense against disease. There seems to be evidence too that in some individuals who have essentially normal levels of antibody in the blood, the antibody seems to be ineffective, a weapon against disease that for some reason won’t fire.

The study of these patients may lead to knowledge of the secrets of normal antibody production, and it may also tell doctors more about sensitizing antibodies and how they work.

Probably no venture into the unknown is accompanied by complete agreement—and this trip into the strange world of immunity and allergy is no different. The road to reason and research branches off time after time, and each time scientists disagree as to which fork to take.

Little of the recent laboratory work and the stress on immunological research has been able to bear fruit for the doctor who treats allergies, who treats patients. Yet it does hold some promise, and it is certainly affecting the direction scientists are taking in their thinking.

It doesn’t especially help the doctor in the clinic who wants a purer

allergen to treat his patients, to increase the effectiveness of desensitization, and give surer skin tests. But it might in the future.

One leading expert told an allergy meeting: "Because of the differences of opinion, the newer immunologic concepts and their impact on clinical allergy have had a tendency in some instances to divide us. Even though few specific discoveries, perhaps, have clinical value to the clinical allergist today, yet these newer immunologic concepts and techniques have begun to change the face of allergy."

One researcher pointed to the work aimed at defining precisely the chemical and physical shapes and ways of operating of the very things that cause allergies, the allergens themselves, from pollen to cat to dander.

"Hopefully," he said, "this will provide the allergist with dependably potent and, possibly, chemically pure allergens for diagnosis and treatment in place of the relatively crude mixtures presently employed. Or, if this high plateau cannot be reached, at least improved methods of extracting and standardizing allergenic materials may be achieved."

The way of allergic research now is necessarily broad and is intertwined with other areas of research—including the nature of how the body rejects skin and organ grafts, whether there are antibodies produced to tumors, and whether the body, in a mix-up of normal processes, fashions antibodies to its own organs and causes its own disease.

Scores of researchers are trying to devise systems that will test for allergy outside the body. Many of the techniques are in their infancy, but they are aimed at producing a reaction in tissues cultivated outside of the patient's body.

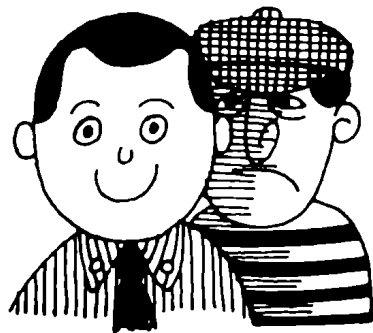
It may be that the answers uncovered by doctors pursuing the secrets of allergy will also be useful in unlocking mysteries of other diseases. And certainly the converse is true too, that work in cancer and other diseases may provide clues to the nature of the allergic state.

Hypersensitivity, a researcher said, may be able to explain other "diseases of obscure origin."

"The clinical allergist must broaden his outlook to embrace much more than the traditional 'allergic' diseases," he said. If things seem confusing and complex now, it may be only a reflection of how much we don't know.

Quoting the noted biologist Albert Szent-Gyorgyi, a top allergist summed it up, "Nature, basically, must be much simpler than she looks to us."

The same is probably true of the causes and effects of allergy.



Criminal at Bay

LIKE SOME MASTER criminal, allergy has dodged the keenest scientific detectives for centuries by presenting to the world a rogues' gallery of faces.

But now scientists have an incisive and nearly complete dossier on allergy, a file of its many crimes and its means of operation. It took years of patient and careful investigation. It meant failure and argument and the sudden surprise of discovery.

It involved luck—a doctor's chance meeting with a vase of grasses that set him sneezing.

It involved brilliant deduction—the reasoning that a dog died because it had been robbed of its normal defenses.

It took painstaking work—to discover that some individuals become sensitive to what is to most of his fellows a harmless material.

It required long and careful questioning—to find that a person who developed an allergy usually had relatives who suffered from a similar kind of distress and had had warning signs of allergy in his own life.

And it called for an open mind—matching such divergent reactions as the sudden stroke of death, the wheezing agony of asthma, the sneezing misery of hay fever, and the sometimes mild, sometimes serious itching of rash and hives.

Allergy is not a new disease. It is a newly discovered disease, its history little more than a hundred years old. Yet much can be done to control it and limit its many miseries. The fact that so much has been learned about it in the past 50 years lends more hope for the future.

How many allergy victims in the past took that long road from hay fever to asthma to still more serious lung disease? How many died because no one could put his finger on the cause of the allergic state? There should be no excuse for that to happen now. Once it could be blamed on the other diseases that obscured the nature of allergy. But the present-day accomplices of allergy are hardly excusable: the patient's own procrastination and ignorance.

It would be fine if allergies would just go away, if the human body could magically solve its own problems, if the passage of years could in some mysterious way rub out the sensitivity. But this rarely happens. Waiting to outgrow an allergy is a dangerous and fallacious thing to do.

The very nature of an allergy leaves physical and emotional scars on its victims. The longer it has to work, the deeper its wounds will be. Children are often the saddest victims of all when treatment is delayed. A child covered with the crusty rash of eczema has little chance for a normal life, nor does a teenager with its brand on his face.

The asthmatic is reminded with every breath how serious an allergy can be. Yet it may all have begun with a warning attack of asthma in childhood, a signal that the worst was yet to come. The hay fever victim, whose life is marred by repeated sinus infections, ought to know that the chances are one in three that his sneezing now may become the wheezing of asthma later.

A strapping individual without a noticeable sign of an allergy may suddenly find that it was that lobster dinner that knocked him cold a few minutes after the meal, left him unconscious and retching on the restaurant floor.

Yet it all can be known, and most of the trouble can be avoided or controlled. The tests are available to discover the cause of eczema, the trigger that sets off hay fever, the secret sting that brings on asthma. They have become more sure than ever before. And the treatments that may follow them are more effective. Nor are the ways of the allergist painful. The needles used are small and thin. Should an untoward reaction occur, as it might sometimes, the allergist is there to counter it immediately.

Self-diagnosis is a hazard. All it can do is supply the suspicion of an allergy. Armed with that suspicion, the individual should seek expert medical advice. Trying to limit his own diet, by eliminating foods he is suspicious of, is a danger to good nutrition. Selling his home and quitting his job to run away from a suspected pollen that he can't

avoid is equally foolish. Going through a long and expensive effort to rid his home of house dust, because he and he alone thinks house dust is the guilty party, is also silly.

Only by the most careful questioning and the complete cooperation of the patient can a doctor pinpoint the agents that are causing the trouble. He knows what questions to ask. He can evaluate better than the victim the results of attacks. He may follow up his evaluation with skin or patch tests to define positively the extent of the trouble. When the guilty agents are found, only the doctor can determine whether it is best to avoid them, or whether this is hopeless and desensitization treatments should be tried. His problem is to treat his patient without wrecking the patient's life in the process.

The possible causes of allergy are too numerous for the victim to be able to guess what his tormenters are. With some of them, especially foods, experience may have given him a strong hint. But the hint, oftentimes, can be wrong. It may not be fish, but the seasoning on the fish that causes his trouble. Yet he may go along for years avoiding fish, and avoiding expert help. Then, again, he may be allergic to many things, or to a few. Putting his finger on one of them won't solve his allergy.

For the eight or nine million Americans suffering from hay fever, the most common offenders are the pollens of trees, flowers and grasses, especially in the growing seasons. But there are dozens of other causes too—agents that could linger where you work, where you sleep, where you eat. We've seen that everything from inhaled house dust to injected medicine to swallowed food can cause the itchy nose, eyes and irritated upper respiratory tract of hay fever. It can even come from common molds that are carried up from the basement, or in from the garden by the running feet of a child.

For the millions of Americans suffering from asthma, the fact that the disease is at least an accomplice in the deaths of 9,000 persons a year is an awful and frightening thought. The fact that so many asthma victims live a half-life—when they can be helped—is just as appalling.

What is also tragic is that the prevalence of these allergic miseries unattended leads many victims to even more chronic and deadly lung ailments, including emphysema.

New control with drugs and more effective treatments to desensitize individuals to allergic agents cuts down the disability time due to these diseases, gives the respiratory tract "normal" time to recover healthy functions. They also enable youngsters with asthma to rise above their disease, lead more or less normal lives again, and outgrow the idea that they are somehow inferior, second-class citizens.

The role of emotions in the setting up of allergies isn't clear. They have a part in the drama, many believe, but whether they precede or

only follow the development of an allergy isn't known. The fact that the emotions can alter the hormonal balance in the body leads to a physical condition which may or may not improve the climate for an allergy attack. The advice to a frightened or angry person—"Don't break into a rash"—is to the point, for emotions and physical well-being are hardly separate segments of life. They work together.

Indeed, the treatment of a person with an allergic condition requires teamwork too. Some doctors propose that general hospitals add asthma units to their departments to bring the abilities of a number of doctors into play for the benefit of asthmatic children. The team might include an allergist, a pediatrician, a psychiatrist, a specialist on the upper respiratory tract and a chest specialist. Add to these a social worker to enlist the aid of the family in the child's care.

Not only could such a team handle the wild attacks that the asthma victim is prone to, but they could gradually work at clearing up concurrent infections and in general bettering the health of the child. When the child is physically ready to leave the hospital, but the home situation isn't capable of handling his stringent care, he might be sent to a rehabilitation center which could provide for his exercise needs, his educational needs and his medical needs.

The idea of rehabilitation centers for asthmatic children is spreading, but the problem of insuring their uniform quality remains. In the future, hopefully, all centers will adhere to standards now being devised.

Few of the newer approaches show as much promise for the asthmatic child as the complete care of a medical-educational-psychiatric team. The emphasis on exercise and—when possible—competitive sports has been producing important successes.

The boys' football team in Denver that went on to a league championship is just one of these accomplishments. The fact that the boys overcame their breathing problems, endured all kinds of fall weather, and kept their enthusiasm is testimony to the will of the child suffering from asthma. All that has to be done is to find ways to mobilize that will, and stop those who would cripple it with over-concern and over-protection. The concept that the allergic child is still a child with a need for achievement can do much to normalize the life of the asthmatic.

The future can lead to great advances for the allergy victim. Research into the nature of the body's immune response, into the organs that govern that response, can better document the role of sensitizing antibodies. How do they differ from immune antibodies that effectively attack the foreign agents invading the body? What happens when the sensitized antibody links up with its target allergen? What products are released and what are their specific reactions in the body? Are there a few basic bits of protein that can speak for the many allergens that allergists now have to deal with? Can present allergens

be purified and refined further to make them more effective in testing and treatment? Why are some parts of the human system sensitive to a specific allergic reaction, yet other locales are not? Why does the site of the reaction change over a period of time? Why does eczema sometimes accompany asthma or hay fever? Why at other times doesn't it? What, specifically, is the genetic factor that links the allergy of a son to the predisposing but different allergy of his father, or his grandfather?

The questions are endless. But the answers are nearer now than anyone would have dreamed they could be a short time ago. Consider that 100 years ago man did not even know enough to ask the questions!

On the heels of discovering allergy and charting its effects in detail should also come new progress in treatment. Only recently, for instance, did doctors discover that sedatives given to an asthma sufferer might further depress his already difficult breathing. Only recently did they find that in the process of treating asthma cases, some helpful drugs were being overused and were causing adverse effects. Only now have they been able to find a way to unlock the door for the asthma sufferer, letting him out into the active world again. Doctors now, too, guard against the adverse effects of powerful antibiotics and other drugs. They have learned that weapons like penicillin must be used conservatively or their use becomes prejudiced by a growing allergic reaction to it. Antihistamines have proved to be valuable control aides to the allergist, but not cures. And, by the same token, doctors have found some patients who are allergic to the dose of antihistamine itself. They have discovered people who are allergic to a common item on only the second exposure, and others who react to only a few exotic items after an exposure of years.

If there are hopes for the fruits of research ripening now, there are also some disturbing signs that man's world is worsening for the individual with respiratory ills, allergic and otherwise. Prime among the elements that have become factors of our modern society is air pollution. Newspapers daily print a "smog log" reporting the level of the day's contamination of the air. An asthmatic probably needs no such formal announcement of the condition of the air he breathes. He has his own. In fact, there is a wide range of individuals with many other breathing troubles who feel the sting of air pollution. The contaminants released into today's air range from sulfur dioxide to soot, from carbon monoxide and hydrocarbons to dust and the oxides of nitrogen. They conspire with the sunlight and with local weather lids to hang low over the cities of the nation. No city seems to be immune.

In cities where there is continuously unpleasant air, people with respiratory ills show remarkable improvement when they are kept in air-conditioned, air-filtered rooms. The problem of air contamination is serious not only for individuals with breathing troubles. Experts

from coast to coast have warned that many cities are on the brink of the kind of disaster that hit London twice, claiming nearly 4,400 lives, and took "15 extra deaths" in little Donora, an industrial city in the Pennsylvania hills.

But the warnings are hard to answer with action. Smog has become so entrenched in our modern way of life, is so closely tied to our new and burgeoning needs for energy and fuel, that to control it is difficult. Federal officials say that if Los Angeles didn't have one of the best air pollution control systems in the nation it would be impossible to live in. Chicago—with another growing and effective system of control—is fighting thousands of smokestacks and the emissions of more than a million cars. The problem in New York defies description.

The answer to this potential killer, this spoiler of the only air we have to breathe, has to come from the planning tables. Perhaps cities must seek new forms of energy, clean forms, to replace the burning of huge amounts of fossil fuels. Perhaps rapid transit systems will have to be improved so that they will take over some of the passenger load from automobiles.

Perhaps city planners will have to decentralize cities even more, to disperse the use of energy that creates smoke. No one has the answer. It is tied to the social and economic life of the people, to jobs and where and how we live, and to the products we need to fill our modern lives. But it is also tied to health, and for some victims of respiratory ills, the problem is severe right now. When it will strike everyone that way, it is difficult to tell.

If air pollution is a difficult problem for the doctor trying to treat an ill patient, the mobility of the population is equally important. Too often an individual with a severe allergic reaction moves without checking with his doctor. He ends up seeking medical aid in a strange city, and sometimes without the medical records of his illness. The doctor who takes over custody of his health now is greatly handicapped without the records of the previous doctor. This is especially true in children. Sometimes a child with an allergy suffers from a severe attack—especially if he is an asthmatic—and the new doctor is placed at great disadvantage because the details of the case history are not immediately available. Before any allergic person changes his place of residence, he should seek the advice of the physician treating him, getting a list of qualified doctors in the new area he is moving to. The doctor will also give him a copy of his medical record for the next doctor's use.

The medical record will tell the new doctor—who may be called in on an emergency basis—the nature of the past ailments, the success of various treatments, the effectiveness of certain drugs used, how well the allergy is defined, and what should be done next to insure the health of the patient.

It is wrong to consider each episode of physical trouble as an isolated incident in the life of the victim. Health problems are all tied together in that they affect one body. Allergy problems are bound together too—by the nature of the disease itself, by the fact that usually it gets worse, not better, without treatment, by the fact that one attack lays the groundwork for the next, by the complex nature of the agents that cause the attacks, and by the difficulty of finding just what the specific offenders are.

The allergic person is very near to his world in the sense that the usual and unusual elements in it can do him harm, sometimes grievous harm. Because of this, his awareness of the things about him probably has to be somewhat more exact than the awareness of his neighbor who has no allergies.

The allergic patient must take special care of himself. But this needn't be a penalty. When it is woven into the general scheme of health, it need not make the allergy victim a hypochondriac, or a frightened child running from every breeze, or a shut-in afraid to look out the front door. He can make some very reasonable accommodations with his world and the agents in it that cause him trouble. In fact, given good medical advice, he can create from his allergy oftentimes a better concept of health than his non-allergic brother has.

Allergies are not something to be ashamed of. They are a fact of life. They are a subject of federal research as are the common cold, influenza, measles, cancer and heart disease.

The only thing that separates the allergic person from his more fortunate fellow man is too often his frame of mind. Once he accepts his problem and seeks expert advice on it, and makes that advice part of his daily life, he can create a life as full as that of the non-allergic individual—perhaps fuller.

Meanwhile the very prevalence of his disease, and its mystery, have made it a subject of widespread and wide-ranging research. Allergy was discovered, largely, because a few doctors had the ailment themselves. It will be cured because of a greater pressure—the fact that so many millions suffer from allergies, and that their suffering too often endangers their lives.

The world of the allergy sufferer has changed drastically since John Bostock described his own hay fever in the early 1800's and thought it might be caused by sunlight, since Charles Blackley shook some pollen from grass in a vase and got an attack of sneezing as his reward, and since an Austrian scientist put together two Greek words to fashion a new one, allergy.

Glossary

ADRENALIN—Trade name for epinephrine, an extract of the adrenal gland used for treatments of emergencies in allergic diseases.

ALLERGEN—A substance which induces an allergic reaction.

ALLERGIC REACTION—A reaction when the allergen and antibody combine in the cells of a body organ or tissue. Three things happen to the organ or tissue:

- a. There is a spasm of involuntary muscles, such as the muscles in the bronchial tubes or stomach.
- b. There is an increased amount of fluid released from the cells, causing edema or swelling.
- c. There is an increase in certain types of blood cells, called eosinophiles.

Symptoms of allergic reactions depend upon these three. All may be present, but sometimes only two.

ALLERGIC RHINITIS—An allergic reaction in the nose. It is associated with swelling, itching, watery discharge and frequent headaches. Many times there is a drip down the back of the throat which produces an irritating, hacking cough.

ALLERGY—An altered reaction by any part of the body to normal

substances which may be eaten, inhaled or contacted. If an egg is eaten, normally it will be digested, the good parts used by the body and the remainder passed out as waste. If asthma, eczema, hives, or abdominal cramps result, this is an altered or allergic reaction.

ANAPHYLAXIS—without protection. Term used primarily in work on experimental animals, but also to describe immediate severe allergic reactions in humans which result in sudden collapse and, occasionally, death. Examples: Reactions occasionally seen following horse serum and penicillin injections and insect stings.

ANGIO EDEMA—An allergic reaction in the skin and underlying tissue. Similar to hives except the swelling is larger because there are more tissues involved. Popularly called giant hives.

ANTIBODY—Any substance in the bloodstream or other body fluid which exerts restrictive or destructive action on bacteria or other body poisons, or neutralizes their toxins. A skin sensitizing antibody is sometimes called a reagin.

ANTICOAGULANT—A chemical agent which tends to reduce or prevent coagulation of blood.

ANTIGEN—Any substance which when introduced into the body causes the production of an antibody.

ANTI HISTAMINE—A drug which tends to neutralize histamine.

ASTHMA—Frequently an allergic reaction in the lung, producing a spasm of the bronchial tubes, and causing their membrane lining to swell. This mechanical interference with the flow of air produces the typical symptoms of asthma: Difficulty in breathing, especially in getting air out of the lungs, and wheezing and whistling sounds. The spasms of the muscles produce a series of obstructions. The increased secretions also block the bronchial tubes, and the cough associated with asthma is an attempt by the body to help clear air passages. Asthma may be acute or chronic, mild or severe, and may be due to causes other than allergy.

CATARRH—Another name for allergic rhinitis.

COLLAGEN—An albuminoid present in connective tissue, bone or cartilage. On boiling it is converted into gelatin.

CONJUNCTIVAL TEST—A test in which a small amount of an allergen is placed in the eye.

CONTACT DERMATITIS—An irritation of the skin produced by direct contact with some material to which the skin is intolerant. Examples: Poison ivy, nickel and copper jewelry, fabric dyes.

CONTACTANTS—Allergens which reach the system by being touched. Examples: Plastics, metals, fabrics, drugs, insecticides, poison ivy, etc.

CORTICO STEROIDS—See steroids.

CORTISONE—A compound isolated from the adrenal gland, or made synthetically, used in the treatment of various allergies when other means fail.

ECZEMA—An allergic reaction in the skin. The condition may be acute or chronic with redness, itching, pimples, blisters, scabs, crusts, scales and a watery discharge.

ELIMINATION DIET—A diagnostic method of finding food allergens. The trial diet is designed to eliminate the common allergenic foods. Elimination diets are temporary, not permanent.

EMPHYSEMA—A chronic lung disease in which there is abnormal stretching of the lung cells, resulting in breathing difficulties. The exact cause of this condition is not clear, but asthma, air pollution, dust and chemicals are important contributory causes.

GIANT HIVES—See angio edema.

HAY FEVER—An allergic condition characterized by sneezing, stuffiness of the nose, thin watery discharge from the nose, and itching of the eyes, nose and throat. It occurs seasonally, and is caused by an allergic reaction to the pollen of common plants and weeds, and to the spores of mold.

HISTAMINE—A chemical released by the interaction of the allergen antibody and considered the cause of swelling and itching of allergic skin manifestations.

HIVES—See urticaria.

HYPERSENSITIVITY—An exaggerated reaction to any substance.

HYPOSENSITIZATION—The treatment of the patient by small injections of allergenic extract in order to stimulate the production of protective antibodies. See immunization.

IMMUNE—Free from the effects of allergy or infection by either having already had the disease or being protected by an inoculation of an antigen in a minute dose.

IMMUNITY—A state, natural or acquired, in which the body is resistant to an allergy, or other disease.

IMMUNIZATION—The process of rendering immune. Also called hyposensitization.

IMMUNOLOGY—The medical science which has to do with the phenomena of immunity.

INGESTANTS—Substances which when eaten cause allergic reactions. Examples: Eggs, milk, corn, chocolate, lobster, nuts, laxatives, aspirin, etc.

INHALANTS—Allergens which reach the body by being inhaled. Examples: Pollens, dust, mold spores, dander from animals, feathers, etc.

INJECTANTS—Allergens injected into the body. Examples: Antibiotics, serums, vitamins, hormones, insulin, insect stings, etc.

INSULIN—A preparation made from the pancreas of the pig or ox

used to treat various types of allergic diseases by reducing the sugar content of the blood and urine to normal.

INTRADERMAL TEST—A skin test in which a small amount of an allergen is injected between the layers of the skin.

INTRAVENAL TEST—A test in which a substance or material is placed within a vein.

MAST-CELL—A certain type of abnormal blood cell, resembling a connective tissue cell, or one which has an affinity for basic or nuclear stains.

MOLD—A large group of microscopic plants reproduced by spores. Example: Common bread mold.

NASAL TEST—A test in which a small amount of the allergen is placed in the nostril.

PATCH TEST—The placing of a small amount of a suspected allergen under a patch on the skin.

PERENNIAL HAY FEVER—Another name for non-seasonal allergic rhinitis.

PLATELETS—Tiny cells normally found in the blood, important in blood clotting.

POLLEN—The tiny grains formed by plants, necessary to their seed production.

REAGIN—See skin-sensitizing antibody.

SCRATCH TEST—A skin test in which small scratches are made on the skin and the allergen is applied to the scratch.

SEASONAL CATARRH—A name, used in some parts of the country, for hay fever.

SERUM—The fluid portion of the blood or a clear watery fluid of any serous membrane.

SHOCK ORGAN—The organ or tissue in which an allergic reaction takes place. Examples: Nose for hay fever, skin for poison ivy, lungs for asthma, etc.

SKIN SENSITIZING ANTIBODY—See antibody.

SKIN TEST—A method used by allergists for the precise diagnosis of allergic disease. See Scratch, Intradermal. Patch Tests.

STEROIDS—Chemical substances based on the group of waxy or greasy substances found in certain tissues. Corticosteroids are those derived from the adrenal gland cortex.

SPORES—The microscopic “seeds” of molds.

URTICARIA—An allergic reaction in the skin. The reaction produces multiple swellings associated with redness and itching.